977/1

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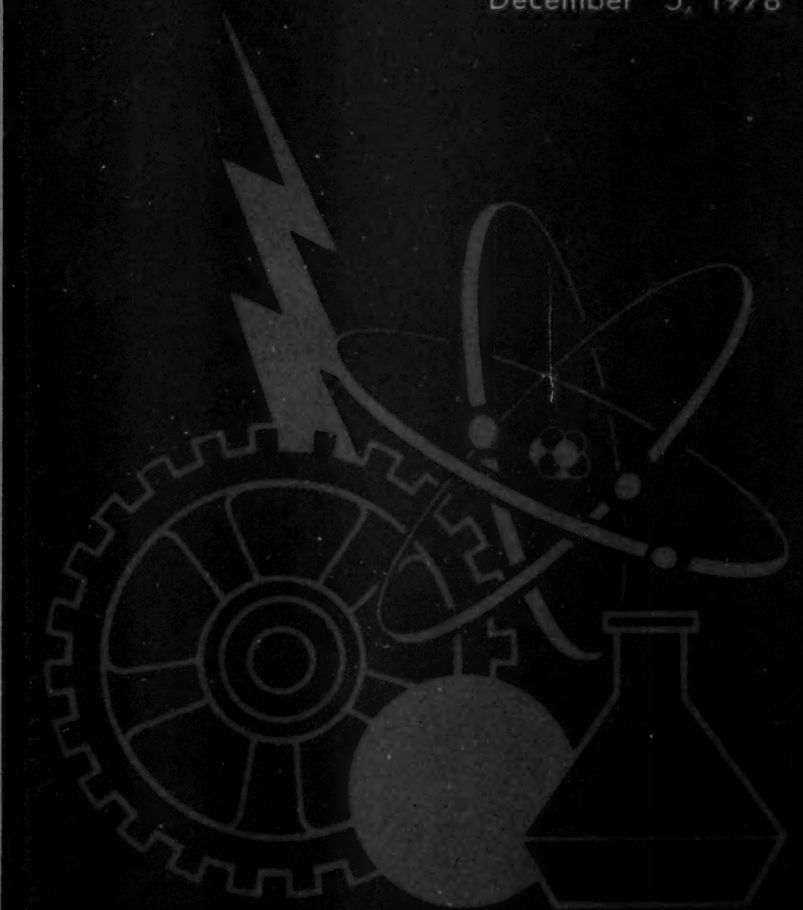
PATENTS

December 5, 1978



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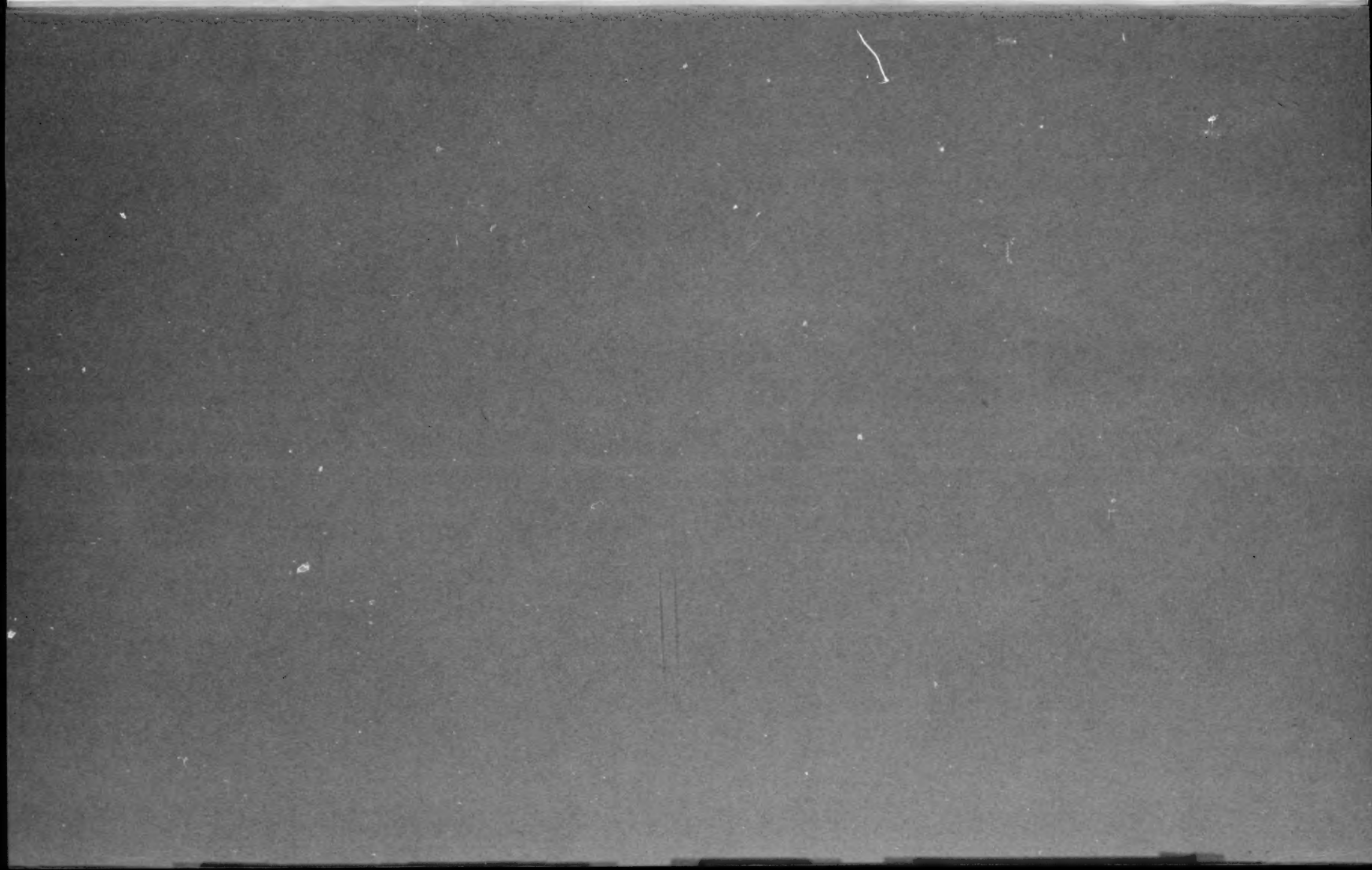

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,585,010, Re. S.N. 948,972, Filed Oct. 5, 1978, Cl. 428/608, CONDUCTING ELEMENT FOR PRINTED CIRCUIT AND METHOD OF MAKING SAME, Betty M. Luce, et al., Owner of Record: *Gould Inc., Chicago, Ill.,* Attorney or Agent: Russell E. Banmann, et al., Ex. Gp.: 223

3,671,542, Re. S.N. 951,051, Filed Oct. 12, 1978, Cl. 260/30.8 R, OPTICALLY ANISOTROPIC AROMATIC POLYAMIDE DOPES, Stephanie Louise Kwolek, , Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: Joseph M. Fitzpatrick, Ex. Gp.: 144

3,819,468, Re. S.N. 949,384, Filed Oct. 6, 1978, Cl. 428/99, HIGH TEMPERATURE INSULATION MODULE, Robert A. Sauder, et al., Owner of Record: *Sauder Industries, Inc., Emporia, Kans.,* Attorney or Agent: Alan H. Gordon, Ex. Gp.: 164

3,824,365, Re. S.N. 948,831, Filed Oct. 5, 1978, Cl. 219/10.55, MICROWAVE OVEN CONTROL SYSTEM, William R. Tapper, Owner of Record: *Litton Systems, Inc., Beverly Hills, Calif.,* Attorney or Agent: Walter R. Thiel, et al., Ex. Gp.: 213

3,827,808, Re. S.N. 950,603, Filed Oct. 11, 1978, Cl. 356/199, METHOD AND APPARATUS FOR MEASURING THE OPACITY OF SHEET MATERIAL IN WHICH THE TRANSMITTANCE SIGNAL IS COMPENSATED FOR THE REFLECTIVITY OF THE MATERIAL, Boong Y. Cho, Owner of Record: *Industrial Nucleonics Corporation, Columbus, Ohio,* Attorney or Agent: C. Henry Peterson, Ex. Gp.: 257

3,984,014, Re. S.N. 946,617, Filed Sep. 28, 1978, Cl. 214/75 R, LIFT ASSEMBLY FOR A VAN OR THE LIKE, Leo Pohl, Owner of Record: *Inventor,* Attorney or Agent: Ernest Peter Johnson, Ex. Gp.: 314

3,993,237, Re. S.N. 949,386, Filed Oct. 6, 1978, Cl. 228/140, METHOD FOR PROVIDING HIGH TEMPERATURE INTERNAL INSULATION, Robert A. Sauder, et al., Owner of Record: *Sauder Industries, Inc., Emporia, Kans.,* Attorney or Agent: Alan H. Gordon, et al., Ex. Gp.: 323

4,016,575, Re. S.N. 943,940, Filed Sep. 20, 1978, Cl. 354/33, EXPOSURE CONTROL SYSTEM FOR FLASH PHOTOGRAPHY, Takashi Uchiyama, et al., Owner of Record: *Inventor,* Attorney or Agent: David Toren, et al., Ex. Gp.: 211

4,052,285, Re. S.N. 950,793, Filed Oct. 12, 1978, Cl 204/195 C, ION SELECTIVE ELECTRODE, John Vincent Dobson, Owner of Record: *National Research Development Corporation, London, England,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 114

4,062,190, Re. S.N. 949,110, Filed Oct. 6, 1978, Cl. 60/682, GAS TURBINE ENGINE, Lindsay G. Dawson, Owner of Record: *Rolls-Royce Limited, London, England,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 341

4,081,369, Re. S.N. 951,078, Filed Oct. 13, 1978, Cl. 210/22 R, COMMON ION EFFECT TO ASSIST LM SEPARATION, Norman N. Li, et al., Owner of Record: *Exxon Research & Engineering Co., Florham Park, N.J.,* Attorney or Agent: Jerome E. Luecke, Ex. Gp.: 176

PATENT NOTICES

Certificates of Correction for the Week of Dec. 5, 1978

D. 247,991	4,094,018	4,084,996	4,098,110
3,772,667	4,094,097	4,085,915	4,098,427
3,809,833	4,094,133	4,086,261	4,098,789
3,881,110	4,094,815	4,086,312	4,098,999
3,937,970	4,094,838	4,087,933	4,099,044
4,024,081	4,094,899	4,088,216	4,099,192
4,044,533	4,095,001	4,088,803	4,099,372
4,051,594	4,095,045	4,088,807	4,099,430
4,052,563	4,095,896	4,088,816	4,099,470
4,063,486	4,095,976	4,090,838	4,099,487
4,065,868	4,096,043	4,090,970	4,100,458
4,069,945	4,096,377	4,091,085	4,102,808
4,072,340	4,096,968	4,091,344	4,112,793
4,073,832	4,096,973	4,091,837	4,112,960
4,073,948	4,097,160	4,092,207	4,113,040
4,075,574	4,097,254	4,092,461	4,113,172
4,076,503	4,097,321	4,093,401	4,113,560
4,077,171	4,097,352	4,093,449	4,113,637
4,080,215	4,097,388	4,093,576	4,113,688
4,081,053	4,097,486	4,093,606	4,113,732
4,082,963	4,097,502	4,093,731	4,113,744
4,084,010	4,097,567	4,093,734	4,114,884
4,084,179	4,097,737	4,093,753	4,119,659
4,084,292	4,097,859	4,093,904	

Disclaimers

3,789,600.—*Paul Leonard Chapman,* Mortlake, London, England. ELECTRONIC TIME MEASUREMENT. Patent dated Feb. 5, 1974. Disclaimer filed Oct. 2, 1978, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

3,964,519.—*Kenneth W. De Baun,* Santa Rosa, Calif. FLUID VELOCITY EQUALIZING APPARATUS. Patent dated June 22, 1976. Disclaimer filed Sept. 25, 1978, by the inventor.

Hereby enters this disclaimer to claims 1, 3, 4, 5, 6 and 8 of said patent.

4,067,055.—*Phillip W. Koetsch,* San Diego, Calif. HIGH-SPEED INDUCTANCE DRIVER. Patent dated Jan. 3, 1978. Disclaimer filed Sept. 6, 1978, by the assignee, *NCR Corporation.*

Hereby enters this disclaimer to all claims of said patent.

Patents Available for License or Sale

3,674,167. VEHICLE AMBULANCE. Bissett J. Roberts, P.O. Box 351, Waynesboro, Pa. 17268.

3,757,703. SUPPORT AND GUIDE MECHANISM FOR PIVOTING A PLATFORM. Bissett J. Roberts, P.O. Box 351, Waynesboro, Pa. 17268.

3,773,198. VEHICLE AMBULANCE. Bissett J. Roberts, P.O. Box 351, Waynesboro, Pa. 17268.

The following five patents are offered for sale. Inquiries should be directed to David C. Jacobson, Esq., 8000 Sears Tower, Chicago, Ill. 60606.

3,960,313. AUTOMATIC SETUP CARTON CONSTRUCTIONS.

3,964,374. CARTON FOLDING AND GLUEING DEVICE.

4,007,869. CORRUGATED CARTON CONSTRUCTIONS.

4,012,996. APPARATUS FOR FOLDING AND COMPRESSION OF CORRUGATED CONTAINER BLANKS.

Re. 29,442. APPARATUS FOR PRODUCING CARTONS.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents & Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Virginia 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent 4,077,857. Method for the Preparation of Perfluoroethers. Filed Feb. 23, 1977. Patented Mar. 7, 1978. Not available NTIS.

Patent 4,078,417. Test Panel for Evaluating Inspection Penetrants. Filed Mar. 24, 1977. Patented Mar. 14, 1978. Not available NTIS.

Patent 4,080,203. Silver Base Brazing Alloy. Filed Dec. 29, 1976. Patented Mar. 21, 1978. Not available NTIS.

Patent 4,081,473. Fluoroalkyleneether Difunctional Compounds. Filed Oct. 29, 1976. Patented Mar. 28, 1978. Not available NTIS.

Patent 4,086,232. Bis-Ethynyl Heterocyclic Compositions and Method of Synthesis. Filed Dec. 23, 1976. Patented Apr. 25, 1978. Not available NTIS.

Patent 4,086,248. Ethynyl-Substituted Aromatic Anhydrides. Filed Dec. 15, 1976. Patented Apr. 25, 1978. Not available NTIS.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,988,429. Kit for the Rapid Preparation of ^{99M}Tc Red Blood Cells. Filed Apr. 16, 1975. Patented Oct. 26, 1976. Not available NTIS.

Patent 3,993,754. Liposome-Encapsulated Actinomycin for Cancer Chemotherapy. Filed Oct. 9, 1974. Patented Nov. 23, 1976. Not available NTIS.

Patent 4,021,669. Nuclear Fuel Microsphere Gamma Analyzer. Filed Mar. 15, 1976. Patented May 3, 1977. Not available NTIS.

Patent 4,055,199. Nozzle Seal. Filed June 3, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,073,624. Method for Fluorinating Coal. Filed Dec. 21, 1976. Patented Feb. 14, 1978. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

Patent application 860,086. Carbocyclic Analogs of Cytosine Nucleofides. Filed Dec. 13, 1977.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., NW.
Washington, D.C. 20240

Patent application 895,694. Rotary Jaw Crusher. Filed Apr. 12, 1978.

Patent 4,055,830. Sonic Measuring System. Filed July 14, 1976. Patented Oct. 25, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent 4,082,583. Solventless Double Base Propellants and Method for Plasticizing MTN Nitrocellulose Propellants Without Use of Solvents. Filed Jan. 14, 1974. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,082,709. Low Leaching Antifouling Organometallic Polyesters. Filed June 24, 1976. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,082,793. Aromatic Phosphinic Acids Containing Sulfone Linkage. Filed Feb. 9, 1977. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,083,031. Acoustic Presence Detection Method and Apparatus. Filed July 23, 1970. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,083,235. Compressor Stall Warning System. Filed May 25, 1977. Patented Apr. 11, 1978. Not available NTIS.

Patent 4,084,047. Stable Alkaline Zinc Electrode. Filed Nov. 29, 1976. Patented Apr. 11, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

Patent application 910,992. Urine Collection Device. Filed May 30, 1978.

Patent application 923,758. Passive Propellant System. Filed July 11, 1978.

Patent 4,087,962. Direct Heating Surface Combustor. Filed July 26, 1976. Patented May 9, 1978. Not available NTIS.

Patent 4,088,018. Magnetic Suspension and Pointing System. Filed June 17, 1977. Patented May 9, 1978. Not available NTIS.

Patent 4,088,094. Tread Drum for Animals. Filed Mar. 31, 1976. Patented May 9, 1978. Not available NTIS.

Patent 4,088,270. Two Dimensional Wedge/Translating Shroud Nozzle. Filed Mar. 31, 1976. Patented May 9, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 900,621. Flutter Prevention Means for Aircraft Primary Flight Control Surfaces. Filed Apr. 27, 1978.

Patent application 900,948. Real Time Digital Recording System for Thermovision Data. Filed Apr. 28, 1978.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents Washington, D. C. 20545

Patent 4,035,156. Filter Type Rotor for Multistation Photometer. Filed Jan. 21, 1977. Patented July 12, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 842,840. Magnetometer Calibration Method and Apparatus. Filed Oct. 17, 1977.

Patent application 852,120. Diver's Composite Umbilical. Filed Nov. 16, 1977.

Patent application 861,236. Telephone System for Diver Communication. Filed Dec. 16, 1977.

Patent application 873,027. Temperature Measuring System. Filed Jan. 27, 1978.

Patent application 876,953. Laser Pile Cutter. Filed Feb. 13, 1978.

Patent application 882,040. Pneumatic Valve. Filed Feb. 28, 1978.

Patent application 882,849. Quick Response Humidity Chamber. Filed Mar. 3, 1978.

Patent application 888,266. Adaptive Line Enhancer. Filed Mar. 20, 1978.

Patent application 899,945. Releasable Electrical Connector. Filed Apr. 25, 1978.

Patent application 901,553. Weak Link Superconducting Switching Apparatus and Method. Filed May 1, 1978.

Patent application 908,487. System for Measuring In-Situ Acoustic Energy Properties of Ocean Floor Soils. Filed May 22, 1978.

Patent application 965,323. Power Line Transient Suppressors. Filed May 12, 1978.

Patent 4,084,255. Positional, Rotational and Scale Invariant Optical Correlation Method and Apparatus. Filed Nov. 2, 1976. Patented Apr. 11, 1978. Not available NTIS.

Patent 4,084,511. Electrolytic Timing Element. Filed June 7, 1960. Patented Apr. 18, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

4,088,806. Intumescent-Ablator Coatings Using Endothermic Fillers. Filed Dec. 23, 1976. Patented May 9, 1978. Not available NTIS.

Patent application 710,798. Flame Retardant Formulations and Products Produced Therefrom. Filed May 30, 1978.

Patent application 912,276. Method of Manufacture of Bonded Fiber Flywheel. Filed June 5, 1978.

Patent application 916,655. Self-Reconfiguring Solar Cell System. Filed June 19, 1978.

Patent application 918,535. Viscosity Measuring Instrument. Filed June 23, 1978.

Patent application 918,537. A Method of Prepurifying Metallurgical Grade Silicon Employing Reduced Pressure Atmospheric Control. Filed June 23, 1978.

Patent application 918,867. A Transparent Photovoltaic Module. Filed June 26, 1978.

Patent application 920,878. Low Density Bismaleimide-Carbon Microballoon Composites. Filed June 30, 1978.

Patent application 920,879. An Improved Solar Cell and Method of Forming the Same. Filed June 30, 1978.

Patent application 920,947. On-Site Ammonia Plant. Filed June 30, 1978.

Patent application 921,626. Chelate-Modified Polymers for Atmospheric Gas Chromatography. Filed June 30, 1978.

Patent application 921,627. Method for Analyzing Radiation Sensitivity of Integrated Circuits. Filed June 30, 1978.

Patent 4,087,902. Field Effect Transistor and Method of Construction Thereof. Filed June 23, 1976. Patented May 9, 1978. Not available NTIS.

Patent 4,088,312. Variable Contour Securing System. Filed Sept. 27, 1977. Patented May 9, 1978. Not available NTIS.

Patent 4,088,408. Device for Measuring the Contour of a Surface. Filed Nov. 8, 1976. Patented May 9, 1978. Not available NTIS.

Parent 4,088,532. Targets for Producing High Purity I–123. Filed Sept. 4, 1973. Patented May 9, 1978. Not available NTIS.

Patent 4,088,926. Plasma Cleaning Device. Filed May 10, 1976. Patented May 9, 1978. Not available NTIS.

Patent 4,088,965. Charge Transfer Reaction Laser With Preionization Means. Filed July 12, 1976. Patented May 9, 1978. Not available NTIS.

Patent 4,089,209. Remote Water Monitoring System. Filed Aug. 4, 1977. Patented May 16, 1978. Not available NTIS.

Patent 4,089,705. Hexagon Solar Power Panel. Filed July 28, 1976. Patented May 16, 1978. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
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Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
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Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 7, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-4-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-3-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-23-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-16-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-6-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-19-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	4-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-3-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	12-19-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-28-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-31-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-24-77

Expiration of patents: The patents within the range of numbers indicated below expire during October 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,002,192 to 3,007,168, inclusive
Plant Patents..... Numbers 2,095 to 2,100, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED DECEMBER 5, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T977,001
LIGHT-SENSITIVE VESICULAR RECORDING MATERIALS

Roy F. Huffey, Ipswich; David E. Lothian, Colchester; Stuart C. Rennison, Hadleigh, and Michael K. Titman, Colchester, all of England, assignors to Bexford Limited Imperial Chemical House, London, England

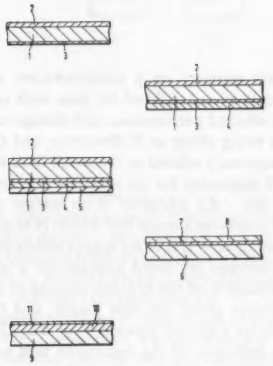
Filed Oct. 17, 1977, Ser. No. 843,060

Claims priority, application United Kingdom, Jul. 7, 1977, 28532/77

Int. Cl.[2] G03C *1/52, 1/40, 1/90, 1/78*

U.S. Cl. 96—75

1 Sheets Drawing. 18 Pages Specification



Light-sensitive vesicular imaging materials, suitable for the production of labels, etc., comprise a light-sensitive vesicular imaging layer applied to one surface of a self-supporting plastics sheet or film preferably a polyester film, e.g., an oriented and heat-set film of polyethylene terephthalate, said light-sensitive vesicular imaging layer comprising a polymeric vehicle having uniformly dispersed therein a sensitizing agent which releases a vesicle-forming gas upon exposure to light and may comprise a nitrogent-liberating diazonium salt, said polymeric vehicle comprising a thermoplastic polymer having a nitrogent permeability constant (as defined in the specification) in the range 1×10^{-15} to 1×10^{-10} and being softenable upon heating above ambient temperature to permit the gas released by the sensitizing agent in the light-struck areas to form light-scattering or reflecting vesicles therein, e.g., a vinylidenechloride copolymer, and at least one light-reflecting metal layer such that an image formed in the light-sensitive vesicular imaging layer is viewed by means of light reflected by the metal layer, e.g., aluminum. The metal is preferably applied as a single layer on the opposite side of the sheet or film from the imaging layer. A dye may be included in the imaging layer and a self- or pressure-sensitive adhesive layer may be applied to the assembly.

T977,002
VESICULAR RECORDING MATERIALS HAVING AN ADHESIVE LAYER

Roy F. Huffey, Ipswich; David E. Lothian, Colchester; Stuart C. Rennison, Hadleigh, and Michael K. Titman, Colchester, all of England, assignors to Bexford Limited Imperial Chemical House, London, England

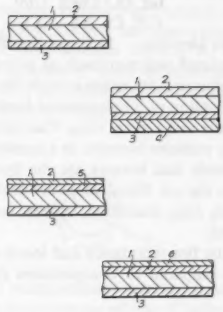
Filed Oct. 17, 1977, Ser. No. 843,059

Claims priority, application United Kingdom, Jul. 7, 1977, 28533/77

Int. Cl.[2] G03C *1/52, 1/40, 1/49, 1/78*

U.S. Cl. 96—75

1 Sheets Drawing. 14 Pages Specification



Light-sensitive vesicular imaging materials, suitable for the production of labels, etc., comprise a light-sensitive vesicular imaging layer applied to one surface of an opaque self-supporting plastics sheet or film, preferably a polyester film, e.g., an oriented and heat-set film of polyethylene terephthalate, said light-sensitive vesicular imaging layer comprising a polymeric vehicle having uniformly dispersed therein a sensitizing agent which releases a vesicle-forming gas upon exposure to light and may comprise a nitrogen-liberating diazonium salt, said polymeric vehicle comprising a thermoplastic polymer having a nitrogent permeability constant (as defined in the specification) in the range of 1×10^{-15} to 1×10^{-10} and being softenable upon heading above ambient temperature to permit the gas released by the sensitizing agent in the light-struck areas to form light scattering or reflecting vesicles therein, and an adhesive layer applied to the other surface of the sheet or film. The imaging layer may be pigmented or dyed or a pigmented or dyed layer may be applied over the imaging layer or between it and the plastics sheet or film. Imaging may be achieved by conventional vesicular imaging techniques.

T977,003
JOINT CEMENT COMPOSITIONS CONTAINING MICA AND QUATERNARY COMPOUNDS

Armand J. Desmarais, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 22, 1978, Ser. No. 908,493

Int. Cl.[2] C08L *1/28, 3/02*

U.S. Cl. 260—17 R

No Drawing. 9 Pages Specification

Asbestos-free joint cement compositions are disclosed com-

prised of a binder, mica, calcium carbonate, a thickener, and a specified quaternary ammonium compound.

It has been conventional to replace asbestos with attapulgite clay to provide the body and anti-sagging properties usually associated with asbestos. Attapulgite, however, must be employed at levels which give rise to a severe cracking problem. The interaction of the quaternary compound with the mica gives the formulations sufficient body that the attapulgite and its attendant cracking problem can be substantially eliminated.

T977,004

FIRE RETARDANT POLYMER COMPOSITIONS

Joseph Dulat, Fetcham, and Leonard T. Arthur, Tolworth, both of England, assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 783,925, Apr. 1, 1977, abandoned. This application Mar. 20, 1978, Ser. No. 888,061

Int. Cl.[2] C08K *5/09*

U.S. Cl. 260—23 S

No Drawing. 11 Pages Specification

A non-halogenated polymer such as polystyrene, polyesters, polymono-olefins or ABS resins is made fire retardant by a low loading combination of a halogenated hydrocarbon fire retardant, zinc borate and a metal soap. The halogenated hydrocarbon preferably contains bromine or a combination thereof with chlorine. Suitable zinc borates are the hydrated zinc borates well known in the art. Metal soaps are preferably those of the metals calcium, zinc, aluminum, barium, cadmium and combinations thereof.

Both synergistic fire retardancy and lower smoke emission are exhibited as compared to compositions excluding the metal soap.

T977,005

STEP ASSEMBLY FLEXIBLY MOUNTED

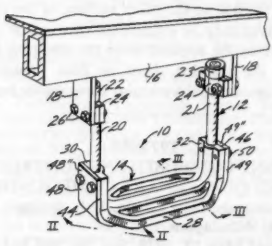
Peter Sidles, Jr., 31 Timberlake Trail, Oswego, Ill. 60543, and Bernard J. Wulff, 1224 Johnston Dr., Aurora, Ill. 60506

Filed Mar. 24, 1978, Ser. No. 889,703

Int. Cl.[2] B60R *3/02*

U.S. Cl. 280—163

1 Sheets Drawing. 5 Pages Specification



A step assembly for a vehicle includes a cable supported step member that has retaining elements which function to prevent rotation of the step about the cable.

T977,006

READ ONLY MEMORY WITH OPTIMIZED DIMENSION FOR IMPROVED PERFORMANCE AND CHIP AREA UTILIZATION

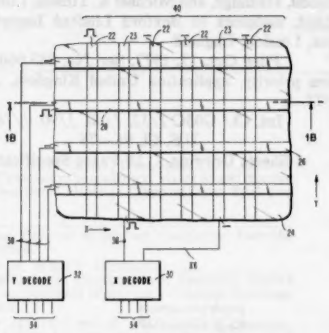
Peruvemba S. Balasubramanian; Edwin C. Grazier; John D. Henke; Robert P. Latham, and Martin J. Myers, all of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 747,140, Dec. 3, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,615

Int. Cl.[2] G11C *17/00*

U.S. Cl. 357—45

2 Sheets Drawing. 16 Pages Specification



A read only memory on a semiconductor substrate having metal word lines and diffused bit lines with optimized dimensions for a selected performance and storage capacity with the metal lines being along an X dimension and the diffused lines being orthogonally related to the metal lines along a Y dimension. The X dimension for the substrate is given by the relation $X = 2^N \cdot WL \cdot K1$ where 2^N is an integer definitive of the number of words on a metal line where N is any integer power greater than zero; WL is word length which equals the number of storage devices per word selected for a word and K1 is a constant definitive of the average spacing in mils between the storage devices along the first length, and the Y dimension being given by a second relation $Y = K2 \cdot Q/2^N$ where K2 is a constant definitive of the spacing in mils between the adjacent rows of storage devices along the second length and Q is the number of said words. Changing the aspect ratio for an array permits the performance of a read only memory to be changed to a different set of X and Y dimensions.

T977,007

PROGRAM MODIFICATION REGISTERS FOR NUMERICALLY CONTROLLED MACHINE TOOLS

Douglas S. Selander, New Berlin, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Feb. 1, 1978, Ser. No. 874,340

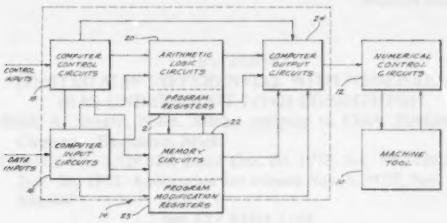
Int. Cl.[2] G06F *15/46*

U.S. Cl. 364—474

2 Sheets Drawing. 7 Pages Specification

By utilizing a set of program modification registers, a numerically controlled machining program can be written with loops and branches like a computer program. The order and action

of the program blocks can be made dependent upon data contained in the program modification registers. The register data



may be altered by the program as it runs or by external inputs to the control circuits.

T977,008

CONTROL OF NEMATODES WITH SELECTED N-AMINOSULFENYL, N-ARYLSULFENYL AND N-ACYLAMIDOSULFENYL DERIVATIVES OF 2,3-DIHYDRO-2,2-DIMETHYL-7-BENZOFURANYL METHYLCARBAMATE

Carmine P. Di Sanzo, and John F. Engel, both of Medina, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 739,218, Nov. 5, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 890,543

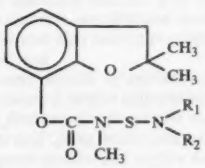
Int. Cl.[2] **A01N** *9/28, 9/00, 9/22*

U.S. Cl. 424—285

No Drawing. 45 Pages Specification

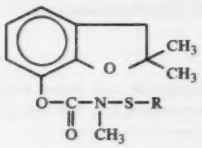
A method is disclosed for the control of nematodes which comprises applying to the situs of infestation certain N-aminosulfenyl carbamates of the formula

I



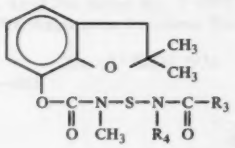
N-arylsulfenyl carbamates of the formula

II

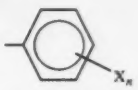


or N-acylamidosulfenyl carbamates of the formula

III



wherein R_1 and R_2 are each independently selected from straight or branched chain alkyl or alkoxyalkyl having 1 to 8 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, phenyl, halophenyl, phenyl(lower)alkyl, halophenyl(lower)alkyl and loweralkoxybenzyl; and wherein R_1 and R_2 may be taken together with the nitrogen to form an optionally substituted heterocyclic ring of 5 to 8 members which may contain one additional hetero atom consisting of oxygen, sulfur, or nitrogen; R is



wherein each X is independently selected from halogen and lower alkyl, and *n* is an integer of *0* to *5* inclusive; and R_3 is hydrogen or lower alkyl and R_4 is straight or branched chain alkyl having 1 to 7 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, phenyl, or benzyl; and wherein R_3 and R_4 may be taken together with the carbonyl and the nitrogen to form an optionally substituted heterocyclic ring of 5 to 8 members, which may contain one additional hetero atom selected from oxygen, nitrogen. and sulfur.

T977,009

GYPSUM WALLBOARD AND METHOD FOR PRODUCING SAME

David H. Dumas, Wilmington, and David R. Warren, New Castle County, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 791,437, Apr. 27, 1977, abandoned. This application Mar. 24, 1978, Ser. No. 889,693

Int. Cl.[2] **B32B** *27/10*

U.S. Cl. 428—476

No Drawing. 11 Pages Specification

Disclosed is a paper-covered gypsum board comprised of a gypsum core and a paper cover sheet covering at least one side of said core, the surface of said paper cover sheet adjacent the gypsum core being surface sized with a sizing composition initially comprised of a hydrophobic cellulose reactive sizing agent and a nitrogen-containing condensation product.

REISSUES

DECEMBER 5, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,854

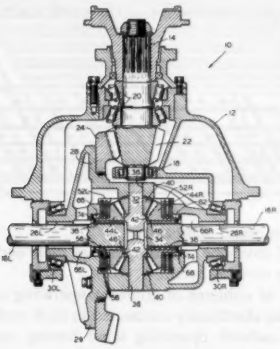
LIMITED SLIP DIFFERENTIAL WITH NEGLIGIBLE BIAS UNDER LIGHT LOAD CONDITIONS

Noah A. Shealy, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Original No. 3,929,036, dated Dec. 30, 1975, Ser. No. 428,265, Dec. 26, 1973. Application for reissue Sep. 9, 1977, Ser. No. 831,840

Int. Cl.[2] F16H *1/44*

U.S. Cl. 74—711 **3 Claims**



8. A limited slip differential mechanism comprising:

a. a differential carrier housing;

b. a cross disposed within said carrier housing and connected for rotation with the carrier housing;

c. an axle shaft rotatably carried by said carrier housing;

d. a planetary gear carried by said cross;

e. a side gear disposed within said carrier housing, and rotatable about the carrier housing axis of rotation, said side gear being disposed adjacent to said cross, with the teeth of said side gear engaging with the teeth of said planetary gear, with the inner end of said axle shaft being drivingly connected with said side gear;

f. friction clutch means for transmitting torque between the carrier housing and said side gear, said clutch means being disposed between an adjacent part of said carrier housing and an inner annular side surface of said side gear and including first friction means connected to the carrier housing and second friction means connected to said side gear whereby an axial force applied to said side gear, via said planetary gear, urges said clutch means first and second friction means into engagement and thus restrict the differential action of said mechanism; and

g. spring means capable of exerting a predetermined force, situated between a further adjacent part of said carrier housing and a first annular thrust side surface of said side gear adjacent to said spring means and axially spaced from said side gear inner annular end surface whereby said side gear is urged in a direction opposite to the direction of said axial force applied to said side gear via said planetary gear, thereby normally tending to urge said clutch means first and second friction means into disengagement as long as said predetermined force is greater than said axial force, thereby providing negligible bias to said axle shaft under light load conditions, wherein said spring means comprises a Belleville spring, with one radial surface thereof engaging said further adjacent part of said carrier housing and the other radial surface thereof engaging said side gear first annular thrust side surface, thereby normally tending to urge said clutch means first and second friction means into disengagement as long as said axial force is less than said predetermined force.

Re. 29,855

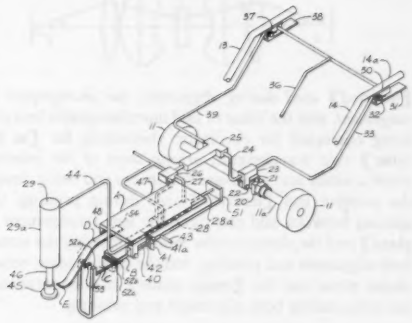
FASTENER POSITIONING DEVICE

Edward L. Thomas, 103 Chapman Rd., Greenville, S.C. 29603

Original No. 4,015,746, dated Apr. 5, 1977, Ser. No. 652,298, Jan. 26, 1976. Application for reissue Nov. 9, 1977, Ser. No. 850,245

Int. Cl.[2] B65H *3/36*

U.S. Cl. 221—263 **2 Claims**



8. A device for feeding fasteners having an enlarged impact receiving head and an elongated shank portion extending outwardly from an intermediate position thereof to a fastener receiving means comprising:

a housing;

an elongated member slidably carried by said housing;

means at one end of said elongated member open at an end and side of said elongated member receiving a fastener with the shank projecting therebelow;

a retaining means maintaining the fastener on the elongated member;

means moving said elongated member forwardly carrying the fastener for reception by the fastener receiving means prior to rearward movement of the elongated member permitted by means open at an end releasing said shank portion formerly disposed therein; and

a wheeled vehicle on which said device is carried including fastener feeding means for presenting fasteners for reception at said side of said means at one end of said elongated member.

Re. 29,856

PROJECTION LENS FOR MASK PATTERN PRINTING

Ichiro Kano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Japan

Original No. 3,897,138, dated Jul. 29, 1975, Ser. No. 498,286, Aug. 16, 1974. Continuation of Ser. No. 307,389, Nov. 17, 1972, abandoned. Application for reissue Apr. 20, 1976, Ser. No. 678,542

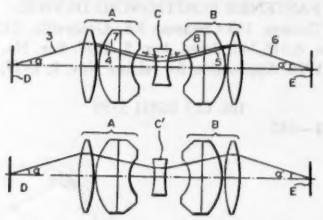
Claims priority, application Japan, Nov. 24, 1971, 46-93709

Int. Cl.[2] G02B *9/64, 13/24*

U.S. Cl. 350—183 **7 Claims**

1. A projection lens for mask pattern printing, *corrected for chromatic aberration with respect to at least three wave lengths,* comprising a photographic lens arrangement which is interposed between [an image plane] *a photo-sensitive means* an an

object plane and used for both the alignment and the printing, and including at least one group of fixedly spaced lenses [corrected for chromatic aberrations with respect to at least four wavelengths,] and a pair of interchangeable lens elements which are interchangeably inserted into said arrangement at identical axial positions therein, *the photographic lens arrangement, with* one of said interchangeable lens elements, being corrected for chromatic aberrations for [at least two of said wavelengths] *an alignment light which does not sensitize said photo-sensitive means* and being designed for the alignment and



[inserted] *used* during alignment; *the photographic lens arrangement, with* the other of said interchangeable lens elements, being corrected for chromatic aberrations for [at least the other] two wavelengths, *among those of the printing light, which sensitize said photo-sensitive means* and being designed for the printing and [inserted] *used* during printing; the axial spacing between said photographic lens arrangement [image plane] *and the photo-sensitive means* remaining the same during both alignment and printing, and the axial spacing between the object plane and the [image plane] *photosensitive* remaining the same during both alignment and printing.

Re. 29,857

CONVERSION WITH ZSM-5 FAMILY OF CRYSTALLINE ALUMINOSILICATE ZEOLITES

Robert J. Argauer, Kensington, Md., and George R. Landolt, Audubon, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Original No. 3,790,471, dated Feb. 5, 1974, Ser. No. 254,799, May 18, 1972. Division of Ser. No. 865,472, Oct. 10, 1969, Pat. No. 3,702,886, and a continuation-in-part of Ser. No. 630,933, Apr. 14, 1967, abandoned. Application for reissue Jan. 3, 1978, Ser. No. 866,576

Int. Cl.[2] C10G *13/06;* **C07C** *15/02;* **B01J** *8/24, 29/28*

U.S. Cl. 208—111 **16 Claims**

1. A process for converting a hydrocarbon charge which comprises contacting the same under hydrocarbon conversion conditions with a catalyst resulting from thermal treatment of a crystalline aluminosilicate zeolite having a composition in terms of mole ratios of oxides as follows:

$$0.9\pm0.2M_{2/n}O:Al_2O_3:YSiO_2:zH_2O$$

wherein M is at least one cation having a valence n, Y is at least 5 and z is between 0 and 40, said thermally treated aluminosilicate catalyst having the X-ray diffraction lines of Table 1 of the specification.

Re. 29,858

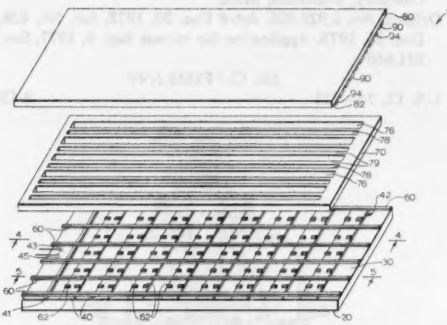
DISPLAY PANEL

Donald E. Miller, Stockton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Original No. 3,995,185, dated Nov. 30, 1976, Ser. No. 636,919, Dec. 2, 1975. Continuation-in-part of Ser. No. 551,359, Feb. 20, 1975, abandoned. Application for reissue Nov. 28, 1977, Ser. No. 855,594

Int. Cl.[2] H01J *61/06*

U.S. Cl. 313—217 **18 Claims**



1. A display panel comprising

a gas-filled envelope including a base plate and a face plate having a viewing window,

a plurality of columns of coplanar operating cathode areas which are electrically connected in each such column, all of said cathode operating areas having upper surfaces facing said viewing window,

said columns of cathode areas including display cathode areas and priming cathode areas, said priming cathode areas providing excited particles for said display cathode areas through gas communication paths extending along said columns of cathode areas,

said display areas and said priming areas also being disposed in rows,

barrier means between said base plate and face plate and having portions which delineate said rows of display areas and said rows of priming areas, [and] *said gas communication paths extending beneath said barrier means from priming cathode areas to display cathode areas, and*

a priming anode overlying each row of priming cathode areas and a display anode overlying each row of display cathode areas, said barrier means also effectively separating adjacent anodes from each other.

Re. 29,859

BROADBAND WAVEGUIDE MIXER

Lloyd T. Yuan, Rancho Palos Verdes, and Jack S. Honda, Palos Verdes Peninsula, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Original No. 3,932,815, dated Jan. 13, 1976, Ser. No. 560,917, Mar. 21, 1975. Application for reissue Jan. 17, 1977, Ser. No. 759,968

Int. Cl.[2] H04B *1/26*

U.S. Cl. 325—445 **11 Claims**

1. A broadband waveguide mixer suitable for use in the microwave and millimeter wave regions comprising:

a. a first waveguide;

b. a second waveguide, said waveguides being disposed substantially parallel *to* and spaced from each other;

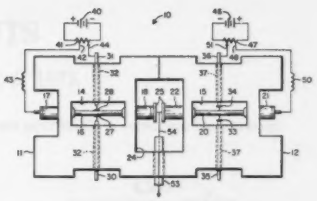
c. a first elongated conductive element extending transversely through said *first* waveguide;

d. a second elongated conductive element extending transversely through said second waveguide, said elements being disposed substantially on a common axis and being spaced from each other;

e. a first pair of diodes arranged back-to-back and disposed in said first waveguide and in contact with said first element;

f. a second pair of diodes arranged back-to-back and disposed in said second waveguide and in contact with said second element, said first pair of diodes having a polarity opposite to that of said second pair of diodes; and

g. a coaxial conductor connected to the adjacent ends of said elements, whereby when [a first wave is impressed on said first waveguide and a second wave of different frequency is impressed on said waveguide, the difference frequency wave is derived from said coaxial conductor] *first and second waves of different frequencies are impressed on each of said first and second waveguides with one of said first and second waves out of phase with the corresponding other first or second wave, a wave having a frequency equal to*



the difference in frequencies of said first and second waves is derived from said coaxial conductor.

PLANT PATENTS

GRANTED DECEMBER 5, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,338

PLUMCOT TREE

C. Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 20, 1977, Ser. No. 862,632

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plumcot tree (plum × apricot) substantially as illustrated and described, which bears medium, firm, freestone fruit having mottled yellow-red flesh and a red exterior color; said fruit has a s· ft down covering similar to an apricot and a pronounced aroma which is predominantly apricot but suggestive of plum, the fruit is further characterized by early ripening and good eating quality.

4,339

APRICOT TREE

C. Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 20, 1977, Ser. No. 862,633

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—39 **1 Claim**

1. A new and distinct variety of apricot tree, substantially as herein shown and described, characterized particularly as to novelty by its ability to be a regular and productive bearer of large fruit of good commercial quality in warm winter areas, by having a low winter chilling requirement, the tree is further characterized by its even distribution of fruit throughout the tree and its uniform ripening of large, firm, freestone fruit of good eating and shipping quality.

4,340

EUONYMUS PLANT

Peter R. Nielsen, Oakville, Canada, assignor to Dugan Nurseries Incorporated, Perry, Ohio

Filed Jan. 9, 1978, Ser. No. 867,829

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—63 **1 Claim**

1. A new and distinct cultivar of *Euonymus fortunei,* known by the cultivar name Sunspot, and characterized particularly as to uniqueness by the combined characteristics of rounded, compact and shapely habit of growth; good winter hardiness, and thick broadleaf evergreen foliage having pronounced yellow centers with dark green margins of irregular depth, with the leaves inside the plant being of the same variegated color as the stem tips, thereby giving the plant as a whole a distinctive and striking yellow spotted appearance.

4,341

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 17, 1978, Ser. No. 870,256

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium;* Ramat., known by the cultivar name Splatter and particularly characterized as to uniqueness by the combined characteristics of spider capitulum type; flat capitulum form; medium yellow ray floret color; diameter across face of capitulum from 100 to 115 mm. at maturity; uniform 10 week flowering response to photoperiodic short-day control; tall plant height; and semi-upright branching pattern.

PATENTS

GRANTED DEC. 5, 1978

ERRATA

For CLASS	See PATENT NO.
015–250.42	4,127,916
405–036	4,127,990
405–202	4,127,991
405–061	4,127,992
362–378	4,128,226
128–305	4,128,351
428–439	4,128,377
400–478	4,128,382
432–058	4,128,392
422–029	4,128,397
422–101	4,128,400
526–036	4,128,510
528–424	4,128,511
521–055	4,128,512
521–050	4,128,513
528–053	4,128,531
528–079	4,128,532
528–279	4,128,533
528–279	4,128,534
528–272	4,128,535
427–054	4,128,536
528–049	4,128,537
546–429	4,128,548
546–202	4,128,549
546–214	4,128,550
546–293	4,128,551
546–294	4,128,552
546–293	4,128,553
546–317	4,128,554
546–290	4,128,555
546–026	4,128,556
562–406	4,128,572
562–465	4,128,573
562–473	4,128,574
562–579	4,128,575
568–571	4,128,587
548–313	4,128,718
548–321	4,128,719
560–009	4,128,720
560–016	4,128,721
365–073	4,128,879

PATENTS

GRANTED DECEMBER 5, 1978

GENERAL AND MECHANICAL

4,127,902

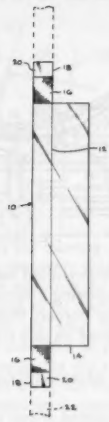
STRUCTURE SUITABLE FOR IN VIVO IMPLANTATION

Charles A. Homsy, 11526 Raintree Cir., Houston, Tex. 77024

Continuation of Ser. No. 694,054, Jun. 7, 1976, abandoned, which is a division of Ser. No. 489,453, Jul. 17, 1974, Pat. No. 3,971,670. This application Mar. 17, 1978, Ser. No. 887,512

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1 **23 Claims**



1. A structure suitable for in vivo implantation comprising

a biocompatible fabric,

a biocompatible film being heat formed into at least a portion of said fabric to set the fabric,

said fabric being heat stable at the heat forming temperature of said film,

said fabric having a weave in which fibers extending in one direction are disposed in twisted pairs whereby when said film is heat formed into at least a portion of said fabric said structure has substantially no permanent yield in one direction responsive to physiological stresses.

4,127,903

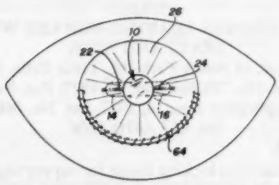
HORIZONTALLY MOUNTED INTRAOCULAR LENS AND THE METHOD OF IMPLANTATION THEREOF

Ronald A. Schachar, 213 N. Barrett, Denison, Tex. 75020

Filed Feb. 3, 1977, Ser. No. 765,385

Int. Cl.[2] A61F *1/16, 1/24*

U.S. Cl. 3—13 **10 Claims**



1. An intraocular lens comprising:

an optic lens dimensioned to be implanted in the anterior chamber of an eye and having a constant radius less than the distance from the center of the lens portion of the eye to the mid region of the iris of the eye,

a pair of elongated rod members each formed into a loop, said loops disposed on opposite sides of said optic lens and extending radially outwardly from said optic lens in opposite directions and dimensioned in radial length to extend from the edge of the pupillary margin of the iris portion of the eye slightly past the mid region of the eye iris, said loops attached at the ends of said rod members to peripheral regions of said optic lens, and

a pair of pin members each attached at one end to said optic lens between the ends of one of said rod members, each pin member having a length at least as great as the length of one of said loops and further having a length such that said optic lens may be implanted in the lens area of the anterior chamber of the eye with said pin members substantially horizontally extending through apertures formed through the mid region of the iris and clipped behind said loops at a position past the mid region of the iris.

4,127,904

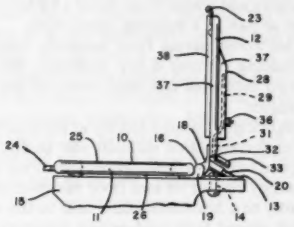
WATER CLOSET SEAT AND BIDET ASSEMBLY

Arnold E. Junker, 24 Sunburst Rd., Bridgeport, Conn. 06606

Filed Sep. 6, 1977, Ser. No. 830,556

Int. Cl.[2] A47K *3/22*

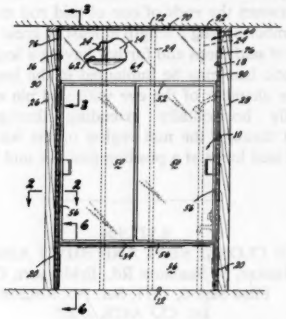
U.S. Cl. 4—7 **9 Claims**



1. A combination toilet seat and bidet assembly adapted for use on a conventional water closet to provide both a normal seat and cover assembly and also a bidet assembly, comprising a seat member and a cover member which are hingedly connected to each other adjacent the rear areas of each to adapt said members to be pivoted between open and closed positions relative to each other, said seat member comprising a generally U-shaped member having both the upper and lower surfaces thereof contoured to adapt both surfaces for use as seating surfaces for the user, said lower surface also being adapted to support said assembly on a water closet, said cover member comprising a generally U-shaped frame having an upper surface adapted to support said assembly in inverted position on a water closet and a lower surface adapted to engage the upper surface of said seat member when said assembly is in closed position, said frame substantially surrounding a central well having walls extending from said frame to the floor of said well in a direction away from the lower surface of said frame, said assembly being adapted for use in (a) normal position on said water closet in which the lower surface of said seat member engages the water closet, the upper surface of said seat member is adapted for sitting by the user and the cover member is adapted to be moved between closed position over said upper surface and open position in which it is substantially perpendicular to said seat member, and (b) inverted or bidet position on said water closet in which the upper surface of said cover member engages the water closet, the central well thereof extends within said water closet and the said seat member extends over said cover member so that said upper surface of said seat member engages the lower surface of said cover

member while said lower surface of the cover member is adapted for sitting by the user.

4,127,905
BATHING FACILITY
Duane C. Bowen, 2551 State St., Carlsbad, Calif. 92008
Filed Jun. 3, 1974, Ser. No. 475,404
Int. Cl.[2] A47K *3/04, 3/16*
U.S. Cl. 4—148 **11 Claims**



1. The improvement in a bathing facility factory manufactured separately and placed in an end of a bathroom which was constructed as part of a building, comprising:

(a) said bathroom having floor members, ceiling members, and studding forming a first bathroom rear and second and third bathroom end walls meeting said rear wall at right angles,

(b) a prefabricated bathing facility at least partly molded of fiber-reinforced plastic material, said facility having a top horizontal rail and a front closure supported from said rail, said facility resting on said floor members and extending upwardly to a horizontal plane near to the height of said rail and spaced from said ceiling members, said facility having a bottom and having rear and end walls molded of plastic and rising from said botton to said horizontal plane, the lower and major portions of said facility rear and end walls being spaced from said studding and said facility rear and end walls having upper, minor marginal portions extending at angles to the remainders of those facility walls to meet said studding and said upper marginal portions ending in upwardly-directed flanges secured to said studding,

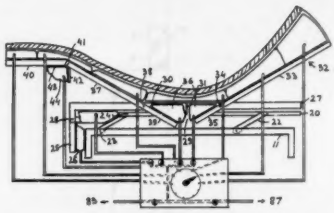
(c) a prefabricated body formed of sheet-like, fiber-reinforced plastic material and molded as one piece and forming a top for said bathing facility, said body being formed separately from said bathing facility and being connected thereto during installation in said bathroom,

(d) said body including an upright wall molded as a unitary part of said body extending substantially vertically from said ceiling members to the top of said rail and from said second to said third bathroom end wall, said upright wall having a first flange at its upper edge secured to said ceiling members and having second and third flanges at the ends thereof secured to said studding of said second and third bathroom end walls, said bathroom having ceiling finishing sheet-thickness materials and wall finishing sheet materials lapping and concealing said first flange and said second and third flanges respectively,

(e) said body extending from a forward portion near said rail rearwardly and ending in rear and end portions substantially meeting the upper margins of said rear and end walls of said bathing facility substantially at said horizontal plane and together therewith forming rear, end and top watertight walls for said bathing facility, said body being domed between its forward and rear portions with the central portion thereof higher than said forward and rear portions thereof, and

(f) said ceiling members and said studding being unfinished above, to the rear of and to the ends of said body, said bathing facility and said body together forming the finish for said end of said bathroom.

4,127,906
ADJUSTABLE BED-CHAIR
Henry C. Zur, 10 W. Griswold, Phoenix, Ariz. 85021
Filed Jul. 15, 1976, Ser. No. 705,543
Int. Cl.[2] A61G *7/10*
U.S. Cl. 5—66 **16 Claims**



1. In an adjustable power tilted bed,

(a) a base frame comprising a rectangular top and four legs depending from the corners thereof;

(b) a first panel mounted on said frame and movable relative thereto;

(c) power means for adjusting the first panel relative to said frame;

(d) a second panel pivoted at one end to an end of said first panel and formed with a central downwardly opening recess defined by an upper back and presenting open ends;

(e) a body supporting assembly comprising a back support, a knee support, and a leg support;

(f) a pivotal connection between said back support and said second panel at one end of said recess whereby an end portion of said back support extends into said recess;

(g) power means between the back of said recess and said end portion for adjusting said back support relative to said second panel;

(h) a pivotal connection between said knee support and the second panel at the other end of said recess whereby an end portion of said middle support extends into said recess;

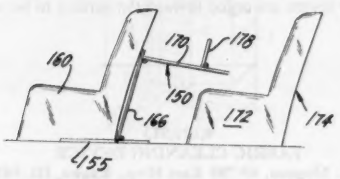
(i) power means between the back of said recess and the end portion of said knee support for adjusting said middle support relative to said second panel;

(j) a pivotal connection between said leg support and said knee support at the end of the latter remote from its pivotal connection to said second panel.

4,127,907
SUPPORT FRAMES ADAPTED FOR USE WITH CAR SEATS AND BEDS
Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424
Division of Ser. No. 758,846, Jan. 12, 1977, Pat. No. 4,075,720.
This application Dec. 14, 1977, Ser. No. 860,622
Int. Cl.[2] A47D *7/04*
U.S. Cl. 5—94 **13 Claims**

1. A universal-type locking frame for supporting or limiting movement of a car bed or car seat, said frame being adapted to be employed in an automobile, comprising, in combination, a support base, at least a portion of which is adapted to extend under an automobile seat, at least a pair of longitudinal spaced apart members, the space between said members being sufficiently large to allow a car bed or car seat to be disposed between said members, each of said members being connected at their lower portions to said support base so that said longitudinal members extend up from said support base and are

adapted to be deployed in close proximity to and extending above the bench portion of an automobile seat in their use position and pivoted downwardly to a folded position substantially transverse to the fore and aft direction of the automobile, and a pair of normally horizontally disposed arm members, an arm member being connected to each of the longitudinal members, said arm members in their working position being disposed above said support base and extending out from the longitudinal members over the bench portion of an automobile seat for supporting or restricting movement of a car bed or car seat deployed on said automobile seat, repositioning means associated with said horizontally disposed arm members and



said longitudinal members for moving and repositioning said horizontally disposed arm members with respect to said longitudinal members said arm members by means of said repositioning means being adapted to be disposed and positioned at various desired locations on said longitudinal members, whereby a car bed or car seat may be positioned on the automobile seat in a manner such that the car bed or car seat extends between and through the space between the longitudinal members so that the longitudinal members and horizontally disposed arm members in conjunction with the backrest portion of the automobile seat may limit movement of the car bed or car seat from side to side and/or front to back, and means for holding said longitudinal members in their use position.

4,127,908

WATERBEDS

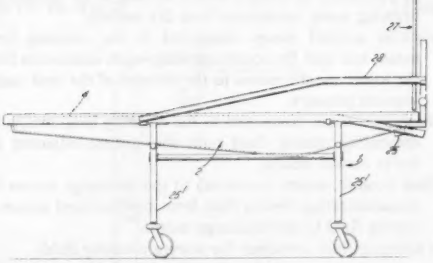
David J. Colwell, London, England, assignor to Keep View Ltd., London, England

Filed Apr. 23, 1976, Ser. No. 679,646

Claims priority, application United Kingdom, Apr. 30, 1975, 18082/75

Int. Cl.[2] A47C *27/08*

U.S. Cl. 5—370 **7 Claims**



1. A waterbed comprising in combination an elongate tray having side walls sloping upwardly and outwardly from a position of maximum depth intermediately located nearer to one end than the other of the waterbed and being of non-uniform depth substantially throughout its extent, heating means associated with the tray for heating the waterbed, and an elongate flexible hollow water fillable envelope container shaped to fit correspondingly within and on the tray and having a substantially flat upper surface supportable on and by a selective volume of water correspondingly filling the container, the depth of which increases progressively from the periphery of the tray towards the position of maximum depth.

4,127,909

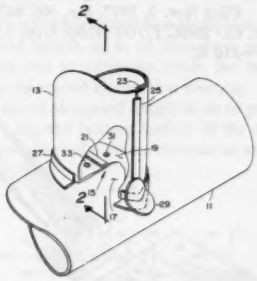
INFLATABLE RAFT CONSTRUCTION AND METHOD

Frank Pizzo, South San Francisco, Calif., assignor to C. J. Hendry Company, San Francisco, Calif.

Filed Sep. 27, 1976, Ser. No. 726,842

Int. Cl.[2] B63C *9/04*

U.S. Cl. 9—11 A **6 Claims**



1. In a method of constructing an inflatable raft, the steps comprising forming a first flat sheet of fabric into at least a partially formed tube by cementing together the longitudinal edges of the fabric at one end thereof, sealing said one end of the tube, placing the partially formed tube on a second flat sheet of fabric, cementing the sealed end of the at least partially formed tube to said second flat sheet of fabric across one-half a surface of cylindrical intersection, folding said second flat sheet over the end of the partially formed tube and cementing the partially formed tube to the second sheet of fabric across the remainder of said surface of cylindrical intersection.

4,127,910

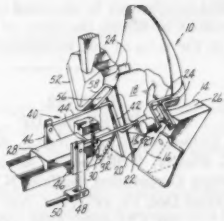
PROCESS FOR STIFFENING FLEXIBLE SHEET MATERIAL

John G. Hollick, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Jun. 14, 1977, Ser. No. 806,559

Int. Cl.[2] A43D *00/00*

U.S. Cl. 12—146 D **10 Claims**



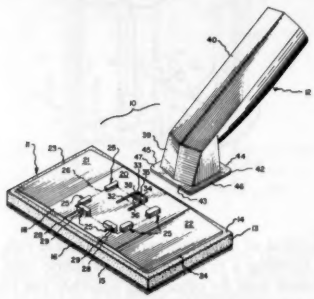
1. The process for stiffening a selected area of flexible sheet material such as an end portion of a shoe upper comprising depositing a pre-determined quantity of hot molten resin as a body of substantial thickness on portions of said area, leaving other portions of said area substantially free from resin, thereafter pressing said area of sheet material and resin together against a press surface while said resin is in hot molten condition to cause said molten resin to flow and spread as a layer substantially thinner than said body of resin extending over said other portions in wetting substantially non-penetrating

relation to sheet material throughout said area, forming said sheet material to a pre-determined three dimensional shape while said resin remains in hot moldable condition and cooling said resin layer to a stiff resilient condition firmly bonded to said sheet material to hold said area substantially in said pre-determined shape.

4,127,911
APPLICATOR WITH MULTI-POSITIONAL HANDLE

Charles D. Cupp, Lancaster; Bruce J. Matthies, Clarence Center, and Frederick J. Wood, Jr., Lancaster, all of N.Y., assignors to Shur-Line Manufacturing Co., Inc., Lancaster, N.Y.

Filed Nov. 2, 1977, Ser. No. 847,763
Int. Cl.[2] B05C *17/00;* **B25G** *1/06, 3/18, 3/30*
U.S. Cl. 15—210 R **9 Claims**

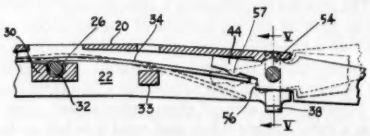


1. An applicator for applying a liquid coating comprising:
a pad including a cushion having upper and lower planar surfaces, working means applied to said cushion lower surface, and a backing plate having a lower surface attached to said cushion upper surface and also having an upper surface, said plate being provided with at least three hooks extending upwardly from its upper surface, one of said hooks being arranged along each of three sides of an imaginary square, said hooks being arranged to face inwardly of said imaginary square to capture an object slidably inserted into said imaginary square from the fourth side thereof; and
a handle having adjacent one end a square plate-like flange extending outwardly therefrom, the dimensions of said flange being slightly smaller than the dimensions of said imaginary square, said flange being adapted to be slidably inserted into said imaginary square to be captured by said hooks;
whereby said handle may be mounted on said pad in any of four positions at which the sides of said flange will be parallel to the sides of said imaginary square.

4,127,912
WIPER BLADE

Raymond A. Deibel, West Falls; Neil A. Gowans, Buffalo, and William C. Riester, Williamsville, all of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Filed Dec. 15, 1977, Ser. No. 860,669
Int. Cl.[2] B60S *1/04, 1/38*
U.S. Cl. 15—250.42 **17 Claims**

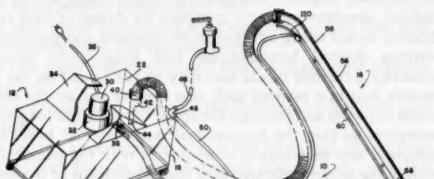


1. In a windshield wiper blade assembly including a flexible, articulated pressure distributing superstructure comprising a central primary lever and a pair of secondary end levers, said levers being arranged end to end, said secondary levers being pivotally connected to said primary lever on transverse axes each at an opposite end of said primary lever; said primary lever comprising a web and depending side walls, said secondary levers each having a connecting projection extending telescopically between said side walls inwardly beyond said transverse axes, a flat leaf spring nestled between said side walls extending longitudinally for substantially the entire length of said primary lever and being fulcrumed medially between the ends thereof, said connecting projections engaging said leaf spring adjacent its ends and interleaved between said web and said leaf spring whereby the outer ends of the secondary levers are urged toward the surface to be wiped.

4,127,913
FABRIC CLEANING DEVICE

Clifford L. Monson, 49-789 Kam Hwy., Kaawa, Hi. 96730

Filed Nov. 11, 1977, Ser. No. 850,570
Int. Cl.[2] A47L *7/00*
U.S. Cl. 15—321 **16 Claims**

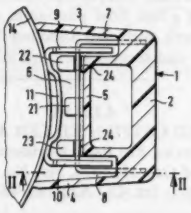


1. Cleaning apparatus comprising
a tank,
a vacuum pump assembly operatively connected to the tank for creating a vacuum within the tank,
means connected to the vacuum pump assembly for communicating electrical power from a source of electrical power to the vacuum pump assembly,
cleaning head means having lower mouth means adapted to be positioned in contact with a surface to be cleaned for drawing waste substances from the surface,
vacuum conduit means connected to the cleaning head means and tank for communicating waste substances from the lower mouth means to the interior of the tank under vacuum pressure,
discharge means connected to the cleaning head means for dispensing rinsing fluid onto the surface adjacent the lower mouth means,
fluid conduit means connected to the discharge means for communicating rinsing fluid from a pressurized source of rinsing fluid to the discharge means,
a cleaning fluid container for storing cleaning fluid,
spray means connected to the cleaning fluid container for directing pressurized air toward the container to urge cleaning fluid from the container and spray the fluid urged from the container onto the surface,
air outlet means connected to the vacuum pump assembly for discharging pressurized air from the vacuum pump assembly, and
air conduit means connected to the air outlet means and spray means for communicating pressurized air from the air outlet means to the spray means.

4,127,914
HANDLE FOR A POT

Wolfgang Fischbach, Daaden, Germany, assignor to Heinrich Baumgarten Eisen- und Blechwarenfabrik, Siegen, Germany

Filed Jun. 1, 1977, Ser. No. 802,415
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1976, 2624478
Int. Cl.[2] A47J 45/06
U.S. Cl. 16—110 A **11 Claims**

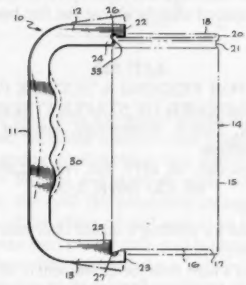


1. In a handle for a container which includes two plates adapted to be welded to the container as carriers for said handle, the plates lying substantially in the fixing direction of the handle, each plate having two oblique edges orientated at an obtuse angle to each other, and at least one spring which, when the handle is pushed onto the carrier plates, is tensioned by means of one of the oblique edges, and which towards the end of the push-on movement comes behind the other edge of the carrier plate and then presses the handle against the container and the carrier plates, the improvement comprised in that the spring consists of a U-shaped steel wire, the handle offering for each shank end of the spring an anchorage which allows the full bending of the spring when the handle is pushed onto the carrier plates, in that the carrier plates engage the bridge of the U-shaped spring, and in that at least one groove is so formed in the handle that the bridge between the shanks of the fully bent spring is engaged with the groove and prevents detachment of the handle from the spring.

4,127,915
SNAP LOCK HANDLE

Thomas D. Logan, 3740 Dover Pl., Los Angeles, Calif. 90039, and Edwin S. Nelson, 140 S. Buena Vista St., Apt. V, Burbank, Calif. 91505

Filed Mar. 28, 1977, Ser. No. 781,562
Int. Cl.[2] B65D 23/10, 25/28
U.S. Cl. 16—114 R **2 Claims**

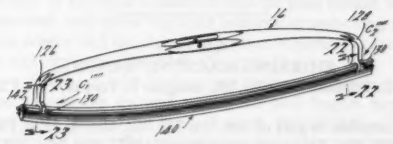


1. A handle for a beverage can comprising:
an elongated handle of a substantially U-shaped configuration and constant thickness;
said handle having a flexible central portion and an upper and a lower connection element outwardly cantilevered at the opposite ends of said central portion in spatial relationship and adapted to move away and towards each other as said central portion is flexed;
said connection elements terminating in free ends, said ends having snap lock attachment means comprising an inner and an outer leg defining a transverse channel therebetween provided in their respective free ends for releasably engaging with the opposite end of the can; and said connection elements being normally biased towards each other;
said inner leg of said lower connection element is flat and of reduced length so as to conform with the adjacent flat surface of the can;
said inner leg of said upper connection element is champered and of reduced length so as to snap lock with a bead carried on the can to yieldably retain the bead in said channel of its associated connection element;
said outer legs are of elongated length so as to project over the respective top and bottom surface of the can; and
said handle is composed of a plastic material so as to provide integral spring bias.

4,127,916
WINDSHIELD WIPER CONSTRUCTION

Johan H. van den Berg; Alex H. van Eekelen, both of Hasselt, and Albert G. Hoebrechts, Mechelen-Bovelingen, all of Belgium, assignors to Monroe Auto Equipment Company, Monroe, Mich.

Division of Ser. No. 438,038, Jan. 30, 1974, Pat. No. 3,978,544.
This application Aug. 19, 1976, Ser. No. 715,994
Int. Cl.[2] B60S 1/38
U.S. Cl. 15—250.42 **1 Claim**



1. A windshield wiper blade assembly comprising,
an elongated wiper element having a flexor member embedded therein and adapted to operatively support said wiper element,
a one-piece molded polymeric bridge member generally coextensive of said flexor member and including an intermediate section adapted to be operatively secured to an associated wiper arm or the like,
means connecting said bridge member to said flexor member whereby to permit said flexor member and wiper element supported thereon to shift longitudinally of said bridge member to accommodate for windshields of varying configurations, said means comprising a pair of opposed claw portions at each end of said bridge member, one of said pair of said claw portions clampingly engaging said wiper element and the other of said pair of claw portions relatively loosely embracing said wiper element and thereby being freely slidable along said wiper element.

4,127,917
PELTING OF ANIMALS

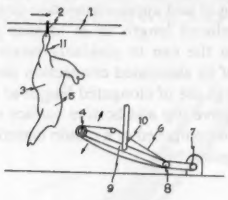
James N. Pohio, 3 Cridland St., Kaiapoi; Douglas E. Richards, 73 Te Awakura St., Christchurch 8; Angus A. J. Robertson, No. 1 R.D., Rangiora; William Williams, CLWYD, Main North Rd., Kaiapoi RD, and Kenneth J. Garnett, 56 Godden Crescent, Mission Bay, Auckland, all of New Zealand

Filed Jul. 12, 1977, Ser. No. 815,004

Claims priority, application New Zealand, Jul. 12, 1976, 181447

Int. Cl.[2] A22B *5/16*

U.S. Cl. 17—21 39 Claims



34. Apparatus for pelting an animal selected from sheep, hoggets and lambs comprising a chain capable of suspending the carcass to be pelted by forelegs thereof with the rear legs free and with the backbone of the carcass disposed away from the direction of movement of said chain, and a roller having its axis of rotation substantially parallel to the direction of movement of said chain at the pelting station, said roller being mounted from a support to move in an arcuate path such that in one position said roller is adjacent to the head of a carcass supported in use on said chain at said pelting station when said head region is stretched outwards and another position away from said animal, the roller being capable between said positions of progressing from said first mentioned position to said second mentioned position while substantially following the contour of the backbone and at least a portion of the rear legs of said carcass, the roller including means capable of engaging a portion of the head region of the pelt of said animal when the pelt on the carcass has been appropriately worked up for pelting, winding said pelt from the carcass during the course of the roller's movement relative thereto so as to accumulate the pelt therearound with the inside of the pelt exposed, and reversing the direction of rotation thereof at said second mentioned position to assist in the removal of the pelt therefrom.

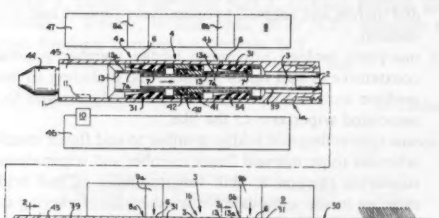
4,127,918
SHIRRING MACHINE MANDREL

Roy L. Trimble, Danville, Ill., assignor to Teepak, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 729,562, Oct. 4, 1976, Pat. No. 4,086,684. This application Apr. 7, 1977, Ser. No. 785,771

Int. Cl.[2] A22G *11/02*

U.S. Cl. 17—41 15 Claims



1. An elongated member particularly adapted for continuously separately supplying two fluids from longitudinally spaced alternating supply sources, said member having first and second receiving areas longitudinally spaced in accordance with the intended spacing of said supply areas, said first receiving area including a first inlet for a first of the fluids and a second inlet spaced from said first inlet in the direction of said second receiving area for receiving a second of the fluids, said second receiving area including in longitudinal sequence a third inlet for receiving the second fluid and a fourth inlet for receiving the first fluid, and passage defining means within said member defining a first flow passage in communication with said first and fourth inlets and a second flow passage in communication with said second and third inlets.

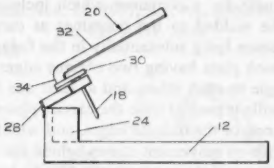
4,127,919
COMBINED CATFISH KILLER AND HOLDER

William A. Buddecke, 820 Paul, Florissant, Mo. 63031

Filed Oct. 18, 1976, Ser. No. 733,098

Int. Cl.[2] A22C *25/06*

U.S. Cl. 17—70 1 Claim



1. A catfish holder for cleaning catfish, said holder comprising a flat base member, a positioning and restraining member for the head of the catfish, said positioning member comprising a vertical transverse member which serves as a stop for the front of the head and a pair of spaced and opposed side wall members for restraining side movement of the head and piercing means for piercing the head of the catfish and impaling the head to pin the head to the holder while cleaning the fish comprising a spike means hingedly mounted to the positioning member spaced a substantial distance above the base member and a handle provided to drive the spike from a head disengaged position to a head engaged position, said spike means comprising a rigid plate-like member hingedly mounted to one of said wall members above the base and a spike fixed to the bottom of said plate-like member, said plate-like member being hingedly mounted on said transverse member above the base member and in a rest position being supported on top portions of said side wall members and said spike in the rest position being hingedly spaced closely above the flat base member.

4,127,920
APPARATUS FOR FEEDING A TEXTILE FIBER BAND COMPOSED OF STAPLE FIBERS

Hermann Gasser, Zurich, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Oct. 14, 1977, Ser. No. 842,051

Int. Cl.[2] D01H *5/00*

U.S. Cl. 19—236 6 Claims

1. An apparatus for feeding a textile fiber band composed of staple fibers, comprising:

means defining a feed path for movement of at least one fiber band in a predetermined direction of travel;

said means defining said feed path comprising a tube having a cross-sectional area amounting to a multiple of the cross-sectional area of a related fiber band moving through said tube;

means operatively connected with said tube for producing a suction flow therein;

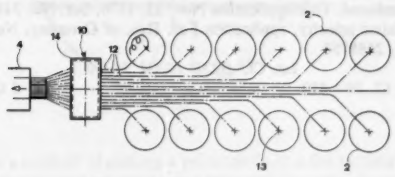
a multiplicity of said tubes; said suction flow-producing

means defining a common chamber at which terminate said multiplicity of tubes;

said suction flow-producing means including means defining a source of negative pressure operatively connected with said common chamber;

outlet means provided for said common chamber for the delivery of the fiber bands from said common chamber;

means cooperating with said outlet means for supporting the fiber bands;



a plurality of driven rolls provided for said chamber;

at least one of said driven rolls comprising said means for supporting the fiber bands;

means cooperating with said outlet means in order to produce a pressure equalization during such time as the fiber bands are supported by said supporting means;

said one roll comprising a sieve drum; and

a stationary guide comb operatively associated with said sieve drum.

4,127,921

HOSE CLIPS

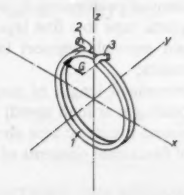
David J. Townsend, Fairbourne, Wales, assignor to Innovation and Technical Development Co., Leeds, England

Continuation of Ser. No. 614,170, Sep. 16, 1975, abandoned. This application May 3, 1977, Ser. No. 793,240

Claims priority, application United Kingdom, Sep. 16, 1974, 40242/74

Int. Cl.[2] B65D *63/10*

U.S. Cl. 24—27 **11 Claims**



1. A hose clip providing a constant locked diameter less than its characteristic unlocked diameter and comprising a coil of generally coil spring configuration and which has two mutually engageable hooked end portions each (a) being reflexed with respect to the coil; (b) projecting in mutually opposite senses and out of the plane of said coil so as to cross over at least one adjacent turn of said coil; and (c) being spaced apart from one another when the hose clip is in its relaxed condition, the hose clip having, in its relaxed condition, at least one complete turn of a first, common characteristic diameter and an incomplete turn, and being elastically deformable without plastic deformation to bring hooks defined by said hooked end portions into mutual engagement for locking said clip, the hose clip assuming in its position with said hooks engaged the configuration of a coil spring having at least two complete turns.

4,127,922

LATCH DEVICE FOR A SAFETY BELT BUCKLE IN A VEHICLE AND METHOD OF ASSEMBLING THE SAME

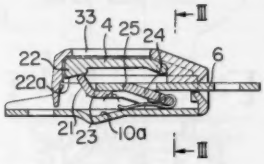
Akira Mita, Fujisawa, Japan, assignor to NSK-Warner, K.K., Tokyo, Japan

Filed Dec. 30, 1976, Ser. No. 755,651

Claims priority, application Japan, Feb. 18, 1976, 51-16837; Oct. 19, 1976, 51-139657[U]

Int. Cl.[2] A44B *11/25*

U.S. Cl. 24—230 A **8 Claims**



1. In a safety belt buckle assembly including a tongue and a latch device for receiving and locking the tongue, the latch device comprising:

a base including a central portion having a downwardly projected recess portion, integral longitudinally extending walls on opposite sides of the central portion having opposed aligned openings, the side walls having integral inwardly directed upper end portions, the side walls having projections for positioning the tongue between the inwardly directed upper end portions and the projections;

a latch member having means at one end pivotally supported in said aligned openings, the latch member having at its opposite end a forward upwardly projecting portion for engagement by a push button, the latch member having an upwardly projecting latching portion substantially centrally thereof and between its ends for locking the tongue, and a flat shoulder portion between said forward upwardly projecting portion and said upwardly projecting latching portion for positioning the tongue thereupon and under said inwardly directed upper end portions;

biasing means disposed between said central portion of the base and said latch member so that the latch member is biased toward tongue-locking position;

a push button for actuating the latch member, the push button being formed at one end with a portion on its underside for engaging said forward upwardly projecting portion of the latch member so that the push button, when operated, will move the latch member to unlocking position where said flat shoulder portion is partially received in said recess portion of the base; and

a cover having an inlet for inserting the tongue therethrough and an opening through which the push button may be operated, the cover being formed therewithin with a portion for pivotally supporting an end of the push button.

4,127,923

DEVICE FOR RELEASABLY SECURING AN AUXILIARY TOOL TO A MANUALLY HELD POWER DRILL

Albrecht Schnizler, Jr., Nürtingen, Germany, assignor to Metabowerke KG Closs, Rauch & Schnizler, Nürtingen, Germany

Filed Jun. 12, 1975, Ser. No. 586,405

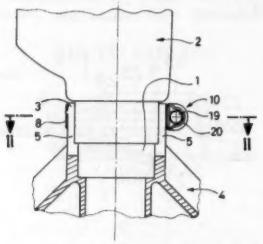
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1974, 2428610

Int. Cl.[2] B65D *63/00*

U.S. Cl. 24—270 **13 Claims**

1. A device for releasably securing the spindle neck of a manually held power drill with an auxiliary tool unit, comprising a manually held power drill having an auxiliary tool unit which is to be powered by the power drill and has a slotted sleeve dimensioned to surround the spindle neck thereof; tensioning means for tensioning said slotted sleeve about the

spindle neck so as to frictionally connect said auxiliary tool unit to the power drill to be powered by the same, said tensioning means comprising a tensioning band surrounding said sleeve and having two end portions; and tool-lessly manually operable means for rapidly engaging and disengaging said tensioning means, comprising a hand lever having one end



articulated to one of said end portions and another end adapted to be gripped by a user, and further comprising a lug connected with the other of said end portions and articulated to said lever intermediate said ends thereof, said lug having one side facing toward and another side facing away from said sleeve, at least said one side being curved in conformance with the circumferential curvature of said sleeve.

4,127,924

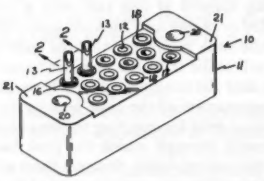
METHOD OF ASSEMBLING ELECTRICAL CONNECTORS

Milton I. Ross, 400 College Ave., Haverford, Pa. 19041

Division of Ser. No. 725,962, Sep. 23, 1976, Pat. No. 4,043,452. This application Jun. 6, 1977, Ser. No. 803,846

Int. Cl.[2] B23P *17/00*

U.S. Cl. 29—413 **7 Claims**



1. In the manufacture of electrical connectors of the type having a row of a plurality of closely spaced tubular openings in an electrically insulative body, and connector pins in said openings and having free ends extending beyond at least a generally planar surface of said body, the method which comprises: inserting a plurality of such pins in said openings a predetermined distance so that they extend as recited; providing an array of "C" rings having a dimension affording frictional retention thereof upon snapping of said rings on said free ends, said array of "C" rings being carried on support means by frangible connections so that they have a center-to-center spacing corresponding to the like spacing of said pins; moving said support means to snap a plurality of said "C" rings onto a plurality of said pins in their region of projection through the recited surface of said body, and relatively moving said support means and said body to break the recited frangible connections of the "C" rings and lock the pins in place.

4,127,925

METHOD OF MANUFACTURING AND LOADING MAGNETIC TAPE CASSETTES, PARTICULARLY COMPACT CASSETTES

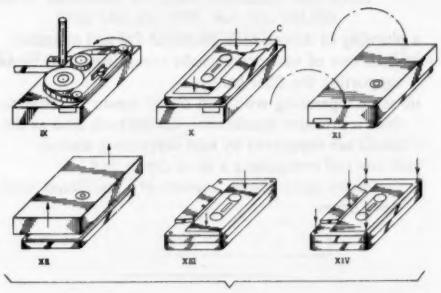
Dieter Gaiser, Diersheim; Josef Woellhaf, Ludwigshafen; Klaus Schoettle, Heidelberg; Friedrich Guenther; Eugen Kamm, both of Willstaett, and Erich Wendt, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 635,177, Nov. 25, 1975, abandoned. This application Nov. 12, 1976, Ser. No. 741,357

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1974, 2455755

Int. Cl.[2] B23P *19/04, 21/00*

U.S. Cl. 29—430 **5 Claims**



1. A process for the manufacture of magnetic tape cassettes in an automated production line utilizing a movable support having accurately shaped and dimensioned recesses formed therein corresponding to the structure of one of said cassette halves for the receipt of the functional elements of the cassette assembly, such as tape guide elements, pressure pads, tape reels and magnetic tape, said process comprising the steps of:

placing the functional elements of said cassette assembly in the corresponding recesses of said movable support by means of mechanical positioning devices;

clipping the magnetic tape to a first tape reel positioned for rotation on said movable support in the plane of said functional elements;

winding a predetermined length of magnetic tape on said first reel by rotating it at high speed;

wrapping said wound magnetic tape about a predetermined path about said functional elements of said cassette assembly;

clipping the free end of said wound magnetic tape to the second tape reel positioned on said movable support;

positioning the inverted lower half of said cassette housing having recesses formed therein corresponding to said functional elements of the cassette assembly over the top of said movable support;

rotating said movable support and positioned lower half of said cassette housing substantially 180° so that said movable support is located above said positioned lower half;

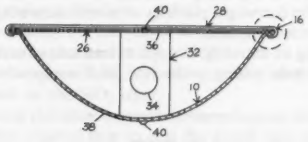
raising said movable support from said lower half of said cassette housing thereby transferring said functional elements, including the wound magnetic tape pack and second reel to said lower cassette half; and

placing the upper half of the cassette housing having recesses formed therein corresponding to said functional elements of the cassette assembly over said lower cassette half and fastening said cassette halves together.

4,127,926
METHOD OF MAKING SOLAR REFLECTORS

George White, Asheville, N.C., assignor to Whiteline, Inc., Asheville, N.C.

Filed Jun. 16, 1977, Ser. No. 807,236
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—453 4 Claims



1. In a method of making a reflector from a flat rectangular sheet of reflecting material into a substantially parabolic cross-sectional shape to form a part of a solar heat collecting system wherein said reflector is supported to concentrate the rays of the sun on a pipe through which liquid is circulated, the novel combination of steps comprising

bending permanently said sheet substantially along its longitudinal center line so that each half portion of said sheet is at a minor angle to the horizontal

bending the longitudinal edges of said sheet back upon themselves to form slotted hook portions

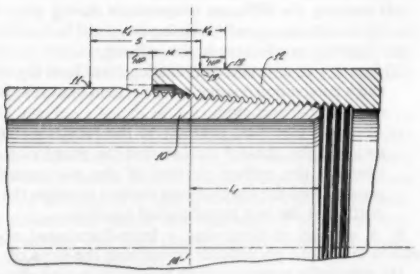
bending said half portions of said sheet toward each other below the breaking points of their elasticity so that the open ends of the hook portions face each other and the elasticity of said portions urges them to return to their original bent position and

inserting the longitudinal edges of a transparent sheet into said hook portions whereby upon release from bending said hook portions press against the top surface of said transparent sheet to hold the assembly together as a unit.

4,127,927
METHOD OF GAGING AND JOINING PIPE

Ernest D. Hauk, 1315 E. 23rd St., Signal Hill, Calif. 90806; Thomas D. Hauk, 5313 Mezzanine Way, Long Beach, Calif. 90808, and Kenneth J. Carstensen, 1811 E. 42nd St., Odessa, Tex. 79762

Continuation-in-part of Ser. No. 728,148, Sep. 30, 1976, abandoned. This application May 2, 1977, Ser. No. 792,568
Int. Cl.[2] B23Q *17/00*
U.S. Cl. 29—407 44 Claims



1. The method of joining threaded frustoconical pipe and collar members, comprising:

(a) marking each of said members at a predetermined axial distance from the hand tight plane thereof,

(b) threading said members together at a predetermined makeup torque,

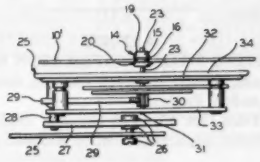
(c) measuring the distance between said marks in a direction axially of the pipe and collar, and

(d) thereafter determining whether or not the distance between the thus-made marks, axially of the pipe, is within a predetermined desired range.

4,127,928
MEASURING METER POINTER ASSEMBLY

Talmage O. Green, Schaumburg, Ill., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Continuation of Ser. No. 541,151, Jan. 15, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,175
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—453 3 Claims

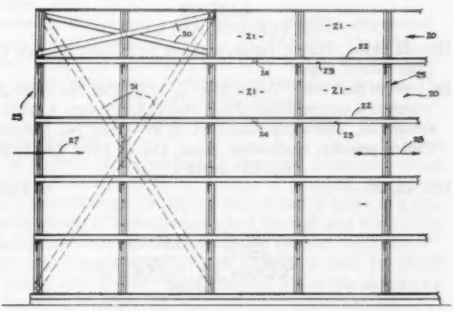


1. A method of articulating the joinder of a flat pointer flexible body with a bearing mount of substantially frusto-conical shape which consists in providing a slitted but peripherally solid mounting hole in said flat pointer flexible body of somewhat larger diameter than the smallest diameter of said frusto-conical bearing mount, telescoping said flat pointer flexible body hole partially over said smallest diameter of said frusto-conical bearing mount, there being a peripheral groove in said frusto-conical bearing mount conical body, and then in a one-step stamping operation press-fitting said flat pointer flexible body over the larger diameter of said frusto-conical bearing mount to lodge the flat pointer flexible body in said peripheral groove of the bearing mount intermediate thereof for permanent deformed clutching engagement with said substantially frusto-conical bearing mount responsive to the deformation of the hole in said flat pointer flexible body.

4,127,929
LAMINATED WOOD WAREHOUSE SUPPORT STRUCTURE

Gerald A. Zapara, Santa Ana, and Lyle G. Zapara, Newport Beach, both of Calif., assignors to National Storage Systems, Inc., Newport Beach, Calif.

Filed Mar. 2, 1977, Ser. No. 773,513
Int. Cl.[2] A47B *57/00*; E04B *1/26*
U.S. Cl. 29—469 10 Claims



1. A method of making a multilevel wooden storage rack structure from stock lumber including the steps of:

prefabricating a plurality of central towers formed by a pair of columns having a laminated ground support junction permanently joining a pair of oppositely-directed lateral

ground arms to the base of the central tower, and having additional laminated support junctions vertically spaced predetermined distances from the ground support junction and from each other, permanently joining pairs of oppositely-directed lateral suspended arms to the central tower without any support underlying the free ends of the suspended arms;

standing the central towers in upright position on their lateral ground arms in spaced apart aligned relationship;

connecting floor joists between the corresponding lateral arms of adjacent central towers with the floor joists in substantial horizontal alignment with the lateral arms; and

laying flooring material on the floor joists.

4,127,930

COATING WITH ANTIFRICTION METAL

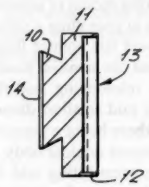
John C. Thomas, Chester-le-Street, England, assignor to Vickers Limited, London, England

Filed Oct. 15, 1976, Ser. No. 732,768

Claims priority, application United Kingdom, Oct. 16, 1975, 42572/75

Int. Cl.² B22D *31/00*

U.S. Cl. 29—527.6 **6 Claims**



1. A method of manufacturing a thrust pad, the method comprising:

casting a metallic thrust pad base, the base having a surface for receiving a molten antifriction metal, the periphery of the surface being formed with a rim which completely surrounds the surface so as to form a recess to retain the molten antifriction metal on the surface;

filling the recess with molten antifriction metal to form a layer of antifriction metal on said surface;

causing the antifriction metal to solidify; and

machining the thrust pad base and the layer of antifriction metal attached thereto to remove those parts which are unwanted in the finished thrust pad.

4,127,931

SEMICONDUCTOR DEVICE

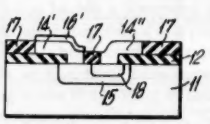
Hiroshi Shiba, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 773,658, Mar. 2, 1977, Pat. No. 4,074,304, which is a continuation of Ser. No. 618,419, Oct. 1, 1975, abandoned. This application Nov. 2, 1977, Ser. No. 848,015

Claims priority, application Japan, Oct. 4, 1974, 49-114408

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **18 Claims**



1. A method of producing a semiconductor device comprising the steps of:

preparing an opening in an insulating film covering one main surface of a semiconductor substrate to expose a portion of the surface of said substrate;

depositing a silicon film on the surface of said insulating film and on the exposed surface of said substrate so as to make direct contact with said exposed surface of said substrate;

selectively oxidizing a portion of said silicon film to form a silicon oxide film having at least a portion in contact with a part of said exposed portion of said substrate, said silicon oxide film forming a plurality of electrode wiring paths of said silicon film; and

introducing an impurity through at least one of said plurality of electrode wiring paths into said semiconductor substrate.

4,127,932

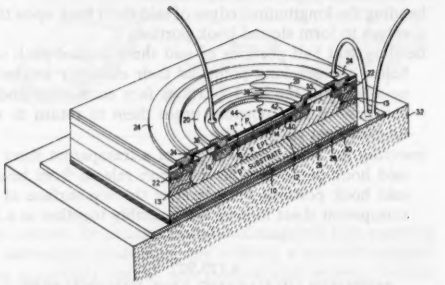
METHOD OF FABRICATING SILICON PHOTODIODES

Adrian R. Hartman, Westfield, N.J.; Hans Melchior, Pfaffhausen, Switzerland; David P. Schinke, Berkeley Heights, and Richard G. Smith, Basking Ridge, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 712,392, Aug. 6, 1976, abandoned. This application May 4, 1977, Ser. No. 793,493

Int. Cl.² B01J *17/00*

U.S. Cl. 29—590 **20 Claims**



1. A method of fabricating a front-illuminated silicon photodiode comprising the steps of:

(a) epitaxially growing a high resistivity π-type silicon layer on a low dislocation density, high conductivity p-type silicon substrate;

(b) forming an n-type guard ring in the π-layer by phosphorus diffusion;

(c) forming in the π-layer a p-type channel stop around the guard ring by boron diffusion;

(d) ramping the diffusion temperature during steps (b) and (c) to reduce crystalline defects;

(e) forming an n^+-layer in the π-layer;

(f) forming an antireflection coating on at least the n^+-layer and a passivation coating on the region between the guard ring and channel stop;

(g) forming electrical contacts to the substrate, the guard ring and the channel stop so that the guard ring contact overlaps the surface portion of the π-n metallurgical junction and the channel stop contact overlaps the surface portion of the π-p metallurgical junction.

6. A method of fabricating a front-illuminated n^+-p-π-p^+ silicon avalanche photodiode comprising the steps of:

(a) epitaxially growing a high resistivity π-type silicon layer on a low dislocation density, high conductivity p-type silicon substrate;

(b) forming an n-type guard ring the π-layer by phosphorus diffusion;

(c) forming in the π-layer a p-type channel stop around the guard ring by boron diffusion;

(d) implanting boron ions in a surface portion of the π-layer within the guard ring;

(e) driving in the implanted boron ions by heating to form a p-layer;

(f) introducing phosphorus into the backside of the substrate effective to getter defects and/or impurities;
(g) ramping the diffusion temperature during steps (b), (c), (e), and (f) to reduce crystalline defects;
(h) forming an n^+-layer in the p-layer;
(i) forming an antireflection coating on at least the n^+-layer and a passivation coating on the region between the guard ring and channel stop by the steps of
(1) forming a thin layer of SiO_2;
(2) annealing the SiO_2 layer at an elevated temperature in an atmosphere containing HCl;
(3) forming an Si_3N_4 layer about onequarter wavelength thick on the SiO_2 layer;
(j) forming electrical contacts to the substrate, the guard ring and the channel stop so that the guard ring contact overlaps the surface portion of the π-n metallurgical junction and the channel stop contact overlaps the surface portion of the π-p metallurgical junction; and
(k) mutually adapting the implanting step (d), the driving step (e) and the forming step (h) in combination with subsequent steps which involve heating so that the resultant electric field profile in the p-layer is substantially triangular and of the desired magnitude.

4,127,933

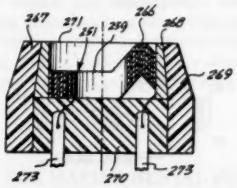
METHOD OF MAKING WORK COIL FOR AN ELECTROMAGNETIC DENT REMOVER

Karl A. Hansen, and I. Glen Hendrickson, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 646,068, Jan. 2, 1976, Pat. No. 4,061,007, which is a continuation-in-part of Ser. No. 489,920, Jul. 7, 1974, Pat. No. 3,998,081. This application Sep. 14, 1977, Ser. No. 833,280

Int. Cl.[2] H01F *41/06*

U.S. Cl. 29—605 **6 Claims**



1. A method of fabricating an electromagnetic dent removal coil having a stressing region of predetermined geometry for establishing a localized concentrated flux region, said method comprising the steps of:

spirally winding a length of flat conductive material and an insulation material to form a tubular coil having a plurality of convoluted conductive layers with electrical insulation interposed between adjacent convoluted layers wherein the edge boundaries of said convolutions and said insulation collectively define first and second oppositely disposed annular coil faces that are spaced apart by a predetermined coil length; and,

machining said coil to form said magnetic stressing region in said first annular face of said tubular coil, said machining including the step of forming an aperture in said second annular face of said tubular coil, said aperture having an axial centerline substantially parallel with each interface between convoluted layers of said tubular coil and having a depth greater than one-half said length dimension of said coil, said aperture having a cross-sectional geometry that corresponds to said predetermined geometry of said stressing region.

4,127,934

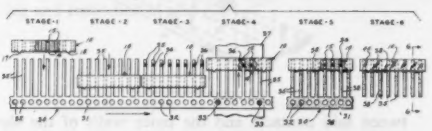
METHOD OF MAKING TERMINAL CONSTRUCTION FOR ELECTRICAL CIRCUIT DEVICE

John E. Bartley, Greenfield; Orville R. Penrod, and Lawrence D. Radosevich, both of Muskego, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Division of Ser. No. 609,780, Sep. 2, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 813,069

Int. Cl.[2] H05K *3/32*

U.S. Cl. 29—626 **6 Claims**



1. A method of anchoring and connecting terminal leads to a substrate containing electrical circuit components on a surface thereof, comprising the steps of:

forming a substrate having a circuit supporting planar surface, oppositely disposed planar sidewall surfaces depending from and disposed angularly relative to said circuit supporting surface, and including a plurality of transversely disposed, spaced apart openings extending through said substrate and intersecting each of the sidewall surfaces at opposite ends of each of said openings;

depositing a conducting termination coating area disposed transversely of at least one of said sidewall surfaces across one end of each of said openings and overlapping a portion of said circuit supporting surface;

depositing a layer of electrical circuit components on said circuit supporting surface with connecting portions electrically connected to the said termination coating;

providing a plurality of terminal leads; inserting individual leads into their respective openings in said substrate with a portion of each lead extending outwardly from the opposite sidewall of the substrate;

deforming the extending portion of said leads; and

moving said substrate and said leads in a direction away from one another to cause the deformed portion of each of said leads to re-enter the respective opening and to be positioned for intimate contact with the surface of said opening.

4,127,935

METHOD FOR ASSEMBLY OF ELECTRICAL CONNECTORS

John P. Ammon, Dallas, Tex., assignor to Elfab Corporation, Dallas, Tex.

Continuation of Ser. No. 659,764, Feb. 20, 1976, abandoned, which is a division of Ser. No. 534,442, Dec. 19, 1974, abandoned. This application Feb. 6, 1978, Ser. No. 875,535

The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.

Int. Cl.[2] H01R *9/16, 13/04, 43/00*

U.S. Cl. 29—629 **5 Claims**

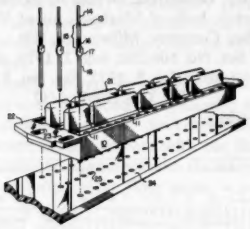
1. A method of assembling an electrical connector which includes an insulative block having a plurality of sleeves formed therethrough by affixing the insulative block to a substrate by means of contacts extending through and frictionally engaging the walls of said sleeves, said method comprising:

inserting contacts through the sleeves in said insulative block, said contacts being retained within the sleeves by frictional engagement with the inner walls thereof;

guiding the portions of said contacts protruding from beneath the insulative block into aligned receiving apertures in a mounting substrate; and

press fitting said contacts into the apertures in said mounting substrate to rigidly secure said contacts to said substrate and permit said insulative block to be readily removed

from said contacts for access thereto by applying an upward force to overcome the frictional engagement be-



tween said contacts and the inner walls of the sleeves through said insulative block.

4,127,936

DEVICE FOR ASSEMBLING ELECTRONIC COMPONENTS ON A PRINTED CIRCUIT BOARD

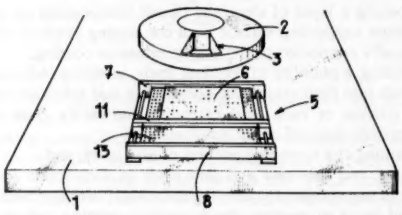
Gustave E. Schlup, Longeau-prés-Bienne, and Edwin Berger, Port, both of Switzerland, assignors to G. E. Schlup & Co., Berne, Switzerland

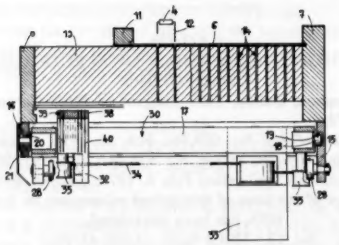
Filed Apr. 4, 1977, Ser. No. 784,185

Claims priority, application Switzerland, Apr. 2, 1976, 4122/76

Int. Cl.[2] **B23P** *19/04, 21/00*

U.S. Cl. 29—721 **3 Claims**





1. A device for fitting electronic components and their connecting leads onto printed circuit boards of a first size, by illuminating the respective holes in the circuit boards through which the respective component leads are to be inserted, said device comprising:

means for mounting at least one circuit board in a first plane;

illuminating matrix means of a second size less than said first size and including a grid of holes having a spacing therebetween at least as close as the closest pair of holes on said circuit board into which said component leads are to be inserted;

carriage means having said matrix means mounted thereon and movable to align selected holes of said illuminating matrix means with respective holes of said printed circuit board into which said leads are to be inserted;

illuminating means for illuminating said selected holes of said illuminating matrix means and said respective holes of said printed circuit board;

said carriage means is movable in a second plane substantially parallel to said first plane in a first direction relative to said printed circuit board; and

said matrix means being movable on said carriage means in a second direction perpendicular to said first direction.

4,127,937

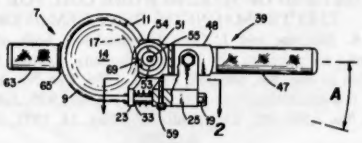
TOOL FOR CUTTING INSULATION FROM ELECTRICAL CABLES

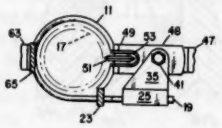
Charles E. Harless, Metropolis, and Ward G. Taylor, Vienna, both of Ill., assignors to The United States Department of Energy, Washington, D.C.

Filed Jan. 11, 1978, Ser. No. 868,637

Int. Cl.[2] **B21F** *13/00;* **B26B** *27/00*

U.S. Cl. 30—90.7 **10 Claims**





1. A hand tool for slitting a sheath of insulation emcompassing an electrical cable, said tool comprising:

a rigid frame including cable-encompassing means defining a region for receiving a section of said cable extending along the axis of said means, said means being provided with a pair of straight arms extending transversely therefrom in side-by-side relation;

a bracket slidably mounted to said arms for movement toward and away from said means;

a handle carried by said frame for turning said frame about said axis;

an insulation-cutting blade carried by and extending axially from said handle; and

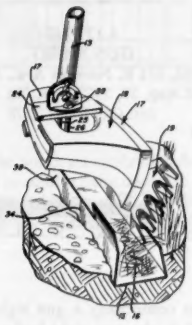
means for pivotally mounting said handle to said bracket in either of two orientations: (1) a first orientation where pivotal movement of said handle effects arcuate slicing movement of said blade in a plane normal to said axis between a position where said blade is disposed outside said region and another position where said blade extends within said region, and (2) a second orientation where said handle is displaced angularly from said first orientation by approximately 90° and where said handle is pivotally movable in said plane to a position where said blade is coplanar with said axis.

4,127,938

VEGETATION TRIMMER WITH CUTTINGS CATCHER

Henry H. Slingerland, Jr., 2800 Ramona Ct., Wilmette, Ill. 60091

Filed Jun. 3, 1977, Ser. No. 803,343
Int. Cl.[2] B26B *19/48;* A01G *3/04*
U.S. Cl. 30—132 6 Claims



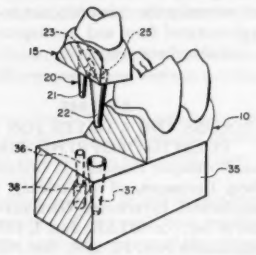
1. In a vegetation trimmer having powered means for cutting in an upright cutting place, the improvement comprising means for catching the cut vegetation including an upwardly opening U-shaped collecting portion having a front portion underlying the bottom of said cutting means, said front U-shaped portion being defined by first and second upstanding legs, said first leg having a height substantially greater than said second leg, and an upwardly opening U-shaped rear portion extending from said front portion to substantially rearwardly of the bottom of said cutting means, said rear U-shaped portion being defined by third and fourth upstanding legs continuing rearwardly from said first and second legs, respectively, said fourth leg having a height substantially greater than said third leg, said powered cutting means being secured to said fourth leg and having cutting blades generally aligned with and extending above said second wall defining said cutting plane.

4,127,939

J-SHAPED PIN FOR MAKING DENTAL PROSTHESIS WITH MEANS FOR DEBRIS ESCAPE

Robert A. Samuel, 3603 Ethan Ct., San Jose, Calif. 95123; Gerald W. Kaminski, 760 Mansfield Dr., San Jose, Calif. 95128, and Michael W. Layne, 112 Capistrano Dr., Los Gatos, Calif. 95030

Filed Jan. 19, 1977, Ser. No. 760,754
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—11 9 Claims



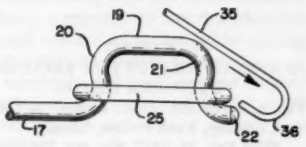
1. An assembly for prosthetic dentistry comprising:
(a) a base, said base being formed with an indexing leg-receiving opening, a locator leg-receiving opening, and a debris-collecting opening, said debris-collecting opening communicating with said indexing leg-receiving opening;
(b) a model secured to said base;
(c) a die in said model removably attached to said base; and
(d) a pin fixed in said die, said pin comprising an indexing leg projecting from said die and received by said indexing leg-receiving opening formed in said base, a locator leg projecting from said die and received by said locator leg-receiving opening formed in said base, and a retention member interconnecting said locator leg and said indexing leg and embodied in said die.

4,127,940

ORTHODONTIST'S INSTRUMENT FOR APPLYING ELASTIC ARCH WIRE-RETAINING RINGS

Douglas J. Shilliday, 4848 Slate Run Ct., Columbus, Ohio 43220

Filed Mar. 2, 1977, Ser. No. 773,743
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—66 2 Claims



1. An orthodontist's instrument for applying an elastic retaining band comprising a relatively elongated handle and a wire-like operative tip rigidly connected with and projecting outwardly from an end of said handle; said tip consisting of a single, substantially rigid wire formed with a generally U-shaped, laterally projecting bight portion having opposed, relatively spaced apart side legs curved slightly inwardly toward one another and defining on the bight portion of said tip a relatively shallow undercut region for the readily releaseable support of an encircling, tensioned, elastic band.

4,127,941

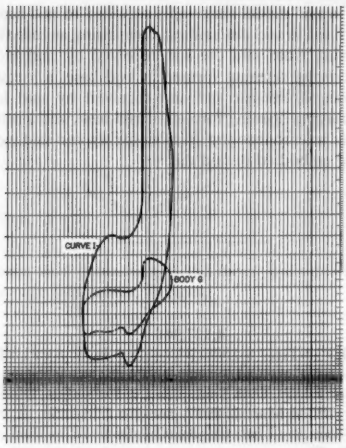
MEANS AND GRAPHICAL METHOD OF CALCULATING MOMENTS OF INERTIA

Richard L. Hoover, Box DY 582 Cave Creek Stage, Phoenix, Ariz. 85020

Filed Aug. 1, 1977, Ser. No. 820,713
Int. Cl.[2] B43L *13/20;* G01B *5/26;* G09B *23/06*
U.S. Cl. 33—1 C 3 Claims

1. A method for determining the Moment of Inertia of a plane surface of interest about an axis of rotation comprising the steps of projecting an area proportional to said plane surface of interest on a specially designed graph paper having an axis and having parallel lines that are proportional to $d^3/3$ where d is the distance from any given point on said plane surface of interest to its axis of rotation, generating a corresponding plane surface on said specially designed graph paper using said projected plane surface of interest and having every point on said corresponding plane surface being equal to $d^3/3$

as compared to the corresponding point on said projected plane surface of interest, and calculating the area under said



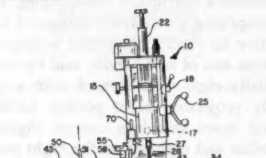
corresponding plane surface which is proportionally equal to the Moment of Inertia of said plane surface of interest.

4,127,942

METHOD AND APPAPARATUS FOR RECONDITIONING CYLINDER HEADS

James F. Flaten, Burnsville, Minn., assignor to Tobin-Arp Manufacturing Company, Eden Prairie, Minn.

Filed Feb. 25, 1977, Ser. No. 771,933
Int. Cl.[2] G01B *3/30*
U.S. Cl. 33—181 AT **8 Claims**



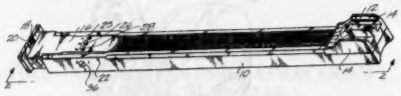
1. An alignment tool for use in alignment of a cylinder head for an engine having a plurality of valve guides in the cylinder head each of which has an axis at the same compound angle with respect to a reference surface of the cylinder head to permit reconditioning said valve guides and for establishing a plane parallel to the plane defined by at least two of said valve guide axes when at least two bore pins having exterior surfaces are placed in two of said valve guides and positioned with the pin exterior surfaces parallel to the axis of the respective valve guides, and for use in combination with a bubble level having a receptacle for mounting said bubble level, said receptacle being oriented to have a receptacle axis perpendicular to the level axis of the bubble level, said tool comprising a bar member having at least one flat side surface adapted to extend between and bear against at least two bore pins mounted in two different valve guides in said head to place the flat side surface parallel to the plane defined by the axes of said valve guides, and having a straight edge extending along said flat surface, an auxiliary pin mounted on said bar and having an auxiliary pin axis parallel to said flat side surface and perpendicular to said straight edge, said auxiliary pin being of size to fit within the receptacle of a level indicator, and means on said bar member to mount said bar means to at least one of said two bore pins with the flat surface thereof physically engaging the exterior surfaces of both of said two bore pins.

4,127,943

GUN SIGHT

Leonard A. Tiritilli, 631 E. Norman Ave., Arcadia, Calif. 91006

Filed Aug. 22, 1977, Ser. No. 826,469
Int. Cl.[2] F41G *1/28*
U.S. Cl. 33—260 **22 Claims**



1. A gun sight comprising a gun sight body; a sight leaf movably secured to the gun sight body; a movable cam between the gun sight body and the sight leaf; a plurality of movable cam followers, each cam follower being independently movable toward or away from the cam; and means for moving the cam into a plurality of predetermined positions for separately engaging each cam follower for providing separate adjustments in the elevation of the sight leaf relative to the gun sight body, each elevation adjustment being independently controllable by the movement of a respective cam follower relative to the cam.

4,127,944

METHOD FOR DRYING WATER-ABSORBENT COMPOSITIONS

Bartolo J. Giacobello, Watchung, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Oct. 17, 1977, Ser. No. 842,775
Int. Cl.[2] F26B *3/00*
U.S. Cl. 34—9 **9 Claims**

1. A method for drying a water-absorbent composition comprising the steps of:

(a) forming a slurry or wet cake of said composition with water and a water-miscible alcohol such that the slurry contains from 20 to 35% solids, by weight, and from 15 to 85% water on solids, by weight, and the wet cake contains 36 to 55% solids, by weight, and from 15 to 50% water on solids, by weight;

(b) feeding the slurry or wet cake onto a heated drum dryer having a surface temperature of 250° to 380° F. at a rate to produce a film of from 10 to 100 mils in thickness;

(c) recovering the dried product in flake form from the drum surface, whereby the dried product is obtained in granular, agglomerated form and has improved water dispersibility and absorbent properties.

4,127,945

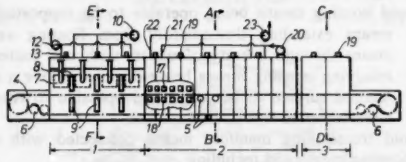
PROCESS AND A DRYER FOR DRYING POLYCHLOROPRENE SHEETS

Karl Nöthen, Dormagen; Francisco B. Creixell, Leverkusen, and Bodo Ehrig, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 691,532, Jun. 1, 1976, abandoned. This application Nov. 30, 1976, Ser. No. 746,189
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1976, 2645921
Int. Cl.[2] F26B *7/00*
U.S. Cl. 34—18 **10 Claims**

1. A process for drying a wet polychloroprene sheet com-

prising the steps of transporting the sheet in a path, applying a flow of warm air simultaneously to both surfaces of the sheet at a rate of 5 to 30 m/sec. at a temperature of 100 to 400° C.,



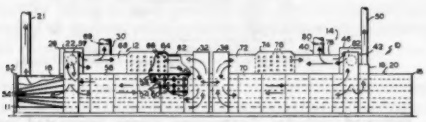
after application of the warm air applying a flow of cool air to the transported sheet to substantially cool it to ambient temperature, and the rate at which the sheet is transported ranging between 1 and 100 m. per minute.

4,127,946

METHOD FOR STEAM DRYING

Adolf Buchholz, 11694 SE. Clover La., Portland, Oreg. 97266

Division of Ser. No. 550,573, Feb. 18, 1975, Pat. No. 4,026,037.
This application May 23, 1977, Ser. No. 799,362
Int. Cl.[2] F26B *3/00*
U.S. Cl. 34—28 **10 Claims**



1. A drying method for removing water from a water containing material to provide a dried product which comprises the steps of:

contacting said water containing material, in a drying zone at drying conditions, with a recycled drying fluid comprising at least a major portion of superheated steam at a first temperature above the boiling temperature of water, whereby at least a portion of the water in said material is vaporized, removed from said material, and comingled with said drying fluid to form an effluent gas stream comprising steam at a second temperature lower than said first temperature;

removing said effluent gas stream from said drying zone and heating said effluent gas stream to about said first temperature;

discarding a minor first portion of said heated effluent gas stream and recycling a major second portion of said heated effluent gas stream to said drying zone to provide said recycled drying fluid;

producing a negative pressure in said drying zone along at least a major portion of its length, said negative pressure being below the ambient pressure of the atmosphere surrounding said drying zone; and

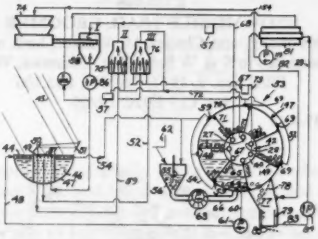
transporting said material through said drying zone along its length from an inlet to an outlet during drying and removing said material from said outlet to provide said dried product.

4,127,947

METHOD AND APPARATUS FOR EVAPORATION OF MOISTURE FROM FRUIT AND VEGETABLE PARTICLES

Wells A. Webb, Buckskin Mountain, Star Rte., Box 23, Orovada, Nev. 89425, and William R. Webb, Berkeley, Calif., assignors to Wells A. Webb, Winnemucca, Nev.

Division of Ser. No. 544,959, Jan. 29, 1975, Pat. No. 4,006,260.
This application Dec. 20, 1976, Ser. No. 752,254
Int. Cl.[2] F26B *13/30*
U.S. Cl. 34—92 **6 Claims**



1. A system for dehydrating food particles comprising in combination:

a pressure vessel having inlet and outlet means;

means defining a plurality of movable chambers moving between said inlet and said outlet and for moving particles via said movable chambers to said outlet;

means for selectively and simultaneously evacuating separate chambers in said vessel and thereby simultaneously establishing separate and distinct pressure zones within said vessel; and

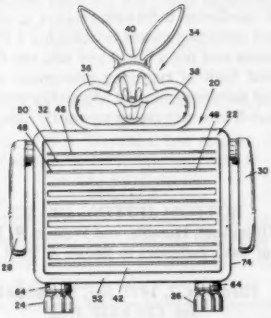
means for selectively communicating a liquid heat transfer medium to said separate chambers within said vessel for establishing separate temperature zones within said vessel so that particles transmitted through said vessel from said inlet to said outlet pass through said separate pressure and temperature zones.

4,127,948

PLAY DESK

Manuel Goy Yu Chin, Santa Ana, and Derek J. Gay, Rancho Palos Verdes, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 12, 1977, Ser. No. 832,416
Int. Cl.[2] G09B *1/06*
U.S. Cl. 35—60 **19 Claims**



1. In a positionable play desk, the combination comprising:

a main body member having first and second play surfaces on opposite sides thereof;

first and second arm members pivotally secured adjacent opposite sides of one edge of said body member;

support members pivotally secured to the edge of said body member opposite said one edge, said support members being positional for supporting said body member in a vertical position on a supporting surface; and

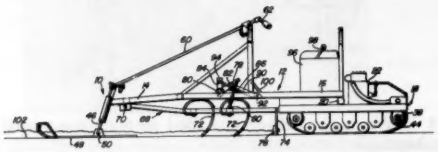
a head member secured to said body member generally centrally with respect to said one edge, said body member, said arm members, said support members and said head member being configured to simulate a character.

4,127,949

SNOWMOBILE TRAIL GROOMER

Gerald Sabrowsky, and Chancy M. Walker, both of Manawa, Wis., assignors to S & W Sales, Inc., Manawa, Wis.

Filed Sep. 9, 1977, Ser. No. 832,106
Int. Cl.[2] E01C *19/00*
U.S. Cl. 37—13 **6 Claims**



1. A snowmobile trail groomer including an elongated main frame including front and rear end portions, an elongated dual track drive assembly oscillatably supported from said rear end portion of said frame for angular displacement about a first horizontal transverse axis, a front dirigible ski equipped support assembly carried by the front end portion of said frame forward of said endless track drive assembly, an elongated longitudinally extending sub-frame including front and rear portions and supported from said main frame front end portion for angular displacement about a second horizontal axis extending transversely of said main frame and the front end portion of said sub-frame, the rear end portion of said sub-frame being disposed forward of said drive assembly and including transversely spaced depending packed and icy snow cover working tines and an upstanding transverse blade member rearward of said tines and including a generally horizontal lower edge portion, and lift means operatively connected between said sub-frame and main frame for selective angular displacement of said sub-frame about said second axis to raise and lower the rear end portion of said sub-frame, and thus said tines and blade member relative to snow cover over which said trail groomer is being forwardly advanced, said endless drive track assembly including a prime mover drivingly connected to the dual tracks of said track assembly and supported from the latter for oscillation therewith relative to said main frame, said lift means including means establishing a lost motion connection between said main frame and said sub-frame, whereby the downward limit of swinging movement of the rear end portion of said sub-frame may be adjustably varied and the rear end of said sub-frame may swing upwardly independent of said lift means.

4,127,950

BOTTOM JETTING DEVICE

William S. Tillinghast, Humble, and William R. Rochelle, Houston, both of Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Jun. 2, 1977, Ser. No. 802,819
Int. Cl.[2] E02F *3/88*
U.S. Cl. 37—62 **10 Claims**

1. An apparatus for jetting and removing material from a submerged surface, said apparatus comprising:

housing means having

a generally upright axis when said apparatus is disposed in a submerged location to effect material jetting and removing in relation to a submerged surface,

a generally downwardly facing, material-receiving opening means extending generally transversely of said upright axis,

said housing means being operable to be supported by means extending downwardly from floating vessel means through a body of water, with said material-receiving opening means being disposed above a submerged surface to be jetted and operable to receive material jetted free of said surface;

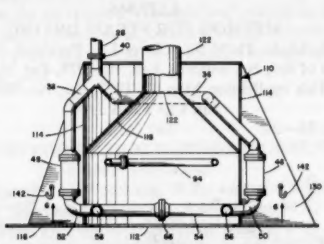
liquid transmitting manifold means connected with said housing means and including

a plurality of at least partially downwardly directed jetting nozzles operable to direct material-removing jets of liquid against said submerged surface and remove material therefrom, and

a plurality of at least partially upwardly directed material impelling nozzles operable to impel material removed from said submerged surface by said jetting nozzles upwardly into the interior of said housing means;

gas transmitting manifold means including

a plurality of gas outlets operable to direct pressurized gas into the interior of said housing means and provide a gas lift effect acting on said material removed from said submerged surface by said jetting nozzles and tending to induce upward passage of said removed material through said housing means;



removed material discharging means connected with an upper portion of said housing means, said material discharging means being operable to

receive said removed material from the interior of said housing means, and

transmit said removed material to the exterior of said housing means; and

liquid jetting intensifying and localizing means including

liquid-transmitting manifold divider means operable to divide said liquid-transmitting manifold means into a plurality of separate and independently operable jetting and lifting zones, each containing at least some of said jetting nozzles and at least some of said material impelling nozzles, and

liquid flow control means selectively operable to direct liquid alternately to selective ones of said jetting and lifting zones and direct said liquid to the totality of said jetting and lifting zones;

said liquid-transmitting manifold divider means and said liquid flow control means being selectively operable, in cooperation, to

intensify and localize the material removing and impelling effects provided by said jetting nozzles and

material impelling nozzles of said liquid-transmitting manifold means in the vicinity of a selected one of said jetting and lifting zones,

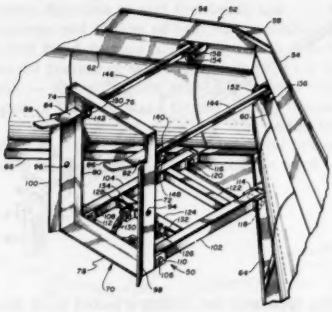
or

provide generally uniform jetting and lifting effects throughout the interior of said housing means.

4,127,951
AUTOMATIC COUPLING MECHANISM FOR SNOW-PLOWS AND THE LIKE

Richard W. Hatch, Rte. #2, Box 31A, Milaca, Minn. 56353

Filed Jun. 30, 1977, Ser. No. 811,591
Int. Cl.[2] E01H *5/04*
U.S. Cl. 37—44 8 Claims



1. An automatic coupling mechanism for snow-plow comprising:

(a) first frame means attachable to a propelling vehicle for cooperating with a plow frame structure of such a snow-plow for movement of the plow along the road;

(b) second frame means constructed and arranged to be connected to such a plow frame structure for lockably connecting with said first frame means;

(c) guide means attached to one of said frame means for guiding said first frame means into lockable relative position with said second frame means;

(d) automatic securing means carried by one of said frame means for locking said first and second frame means to one another when in such position and constructed and arranged to prevent relative horizontal and vertical motion between said first and second frame means when so connected;

(e) free-floating parallelogram pivotal support means carried by said second frame means and constructed and arranged to be pivotally connected in supporting relation between said second frame means and the plow frame structure for supporting such plow and allowing free relative vertical movement thereof with respect to said first and second frame means, and for cooperatively controlling orientation of such a plow relative to said second frame means; and

(f) power lift means connected with one of said frame means and engageable with said support means.

4,127,952
REPLACEABLE ADAPTER FOR AN EARTHWORKING TOOL

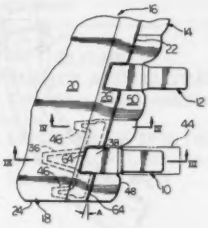
Richard W. Chamberlain, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 20, 1977, Ser. No. 807,944
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—141 R 8 Claims

1. A replaceable adapter (**10**), for an earthworking tool (**16**) having a normal working direction of travel and including a floor (**18**) having a bottom surface (**28**), a leading edge (**22**), a top surface (**20**), and an upwardly facing inclined front surface (**26**) between the top surface (**20**) and the leading edge (**22**), comprising:

a bifurcated body portion (**30**) having a rearwardly extending upper arm (**38**), a rearwardly extending lower arm (**36**), and a forwardly extending nose portion (**42**); and

a wing portion (**32**) having a rearwardly extending lower arm (**46**), forwardly extending cutting edge (**48**), and an upwardly facing inclined front surface (**50**), said wing portion (**32**) being integrally connected to said body portion (**30**), said adapter (**10**) being connected to said tool (**16**) such that said body portion (**30**) is engaged against said bottom surface (**28**) and said inclined front surface (**26**) of said floor (**18**), said body and wing portions (**30,32**)

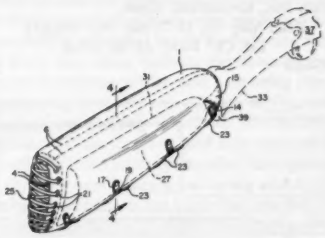


are disposed substantially below said top surface (**20**) of said floor (**18**), said lower arms (**36,46**) of said body and wing portions (**30,32**) are secured against said bottom surface (**28**) of said floor (**18**) at laterally offset locations, and said inclined front surfaces (**26,50**) are arranged in substantially coplanar relation.

4,127,953
ANTI-RECOIL BOOT

Willis M. McBride, Elsie Rt., Box 430, Seaside, Oreg. 97138

Filed Aug. 11, 1977, Ser. No. 823,593
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—1 W 9 Claims



1. An anti-recoil boot for a firearm comprising:

a first outer shell;

a second inner shell connected to the outer shell to form a pocket;

and a metal recoil reducing weight of relatively substantial mass within the pocket.

4,127,954
EXTENDED CAPACITY CARTRIDGE MAGAZINE STRUCTURE

Erich Hausmann, 1025 S. Westlake, Los Angeles, Calif. 90006

Filed Apr. 7, 1977, Ser. No. 785,330
Int. Cl.[2] F41C *25/02*
U.S. Cl. 42—50 8 Claims

1. In a cartridge magazine adapted for use with a firearm having a bolt mechanism, said cartridge magazine including a dispensing opening conformed to cooperate with said bolt mechanism, the improvement comprising:

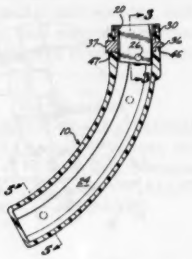
a. housing including a first and second opposingly mating structures secured to surround said dispensing opening at one end thereof;

a follower disposed between said first and second mating structures for sliding articulation therebetween;

a spirally wound spring attached to a first lateral side of said

follower at one end thereof and to said first mating structure proximate said dispensing opening at the other end thereof;

a first longitudinal recess formed within said first mating structure for receiving said spring therein in coiling translation within said housing;



a second longitudinal recess formed in said second mating structure in substantially opposing relationship with said first longitudinal recess; and

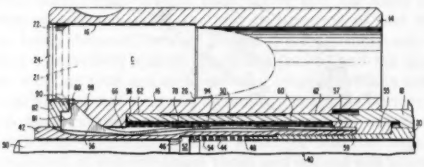
a guide projection extending from the other lateral surface of said follower for sliding translation within said second longitudinal recess.

4,127,955

EXTRACTOR ASSEMBLY FOR RIMLESS CARTRIDGES

Roger J. Curran, Stratford, Conn., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed May 18, 1977, Ser. No. 798,051
Int. Cl.[2] F41C *15/00, 1/00*
U.S. Cl. 42—68 **22 Claims**



1. A cartridge casing extractor assembly for use in a revolver having an annular array of cartridge receiving chambers in its cylinder comprising:

an extractor rod carried concentrically within the cylinder for axial reciprocating movement relative thereto between first and second axial positions,

a plurality of circumferentially spaced extractor segments carried by said extractor rod for reciprocating movement therewith and lying in substantial radial alignment with the respective cylinder chambers, each said extractor segment having an extractor tip movable in a radially outward direction for engagement with the rim of a cartridge casing disposed in the radially aligned chamber,

means carried by said assembly for biasing each said extractor tip for movement in said radially outward direction,

means for preventing radial outward movement of said extractor tips when said extractor rod lies in said first position and enabling radial outward movement of said extractor tips to engage the cartridge casings and extract them from the cylinder chambers in response to axial movement of said rod from said first position toward said second position, and

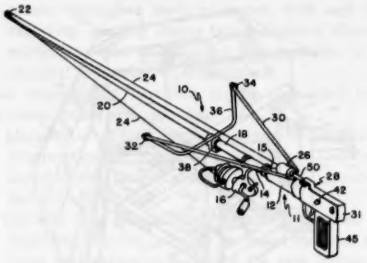
means carried by said rod for limiting the extent of radial outward movement of said extractor tips.

4,127,956

TARGET CASTING APPARATUS

Douglas J. Hertkorn, Key Largo, Fla., assignor to Robert J. McNair, Jr., Cincinnati, Ohio

Filed Aug. 25, 1977, Ser. No. 827,552
Int. Cl.[2] A01K *91/02*
U.S. Cl. 43—19 **9 Claims**



1. Fishing apparatus for casting a baited hook into a target area, comprising:

a fishing rod consisting of, in combination, a hand grip having a butt end, the other end of the hand grip being joined to one end of a reel seat, said reel seat having provisions for affixing thereto a fishing line reel assembly, the second end of the reel seat continuing as a fore-grip section whose second end joins with a flexible rod section, the outermost end of said flexible rod section being terminated by a line guide;

a reel secured to the reel seat of said fishing rod, said reel containing a supply of fishing line, one end of said fishing line being attached to said reel, the other end of said line passing through said line guide and terminating at a baited hook;

a triggering mechanism having at its front end an open ended cylindrical barrel sized to accept the butt of the hand grip section of said fishing rod, said triggering mechanism including a longitudinal slot opening toward the front, said slot having a depressible catch mounted at a cross-axis position therein;

an elastic member having its ends secured by structural support means to the fore-grip section of said fishing rod; and

a bait cup having an open top and a closed bottom, the bottom of said bait cup being secured to the center of said elastic member by one end of a short shaft extending axially outward from the bottom of said bait cup, the second end of said shaft having a cross-axis aperture therethrough, said aperture being penetrable by the catch of said triggering mechanism when the shaft containing said aperture is inserted in the open end of said triggering mechanism slot on the stretching of said elastic member, whereby subsequent depressing of the catch on said triggering mechanism releases the bait cup allowing the elastic member to propel the baited hook with line attached from its repository in the bait cup toward a selected target.

4,127,957

FISHHOOK EXTRACTOR

Thomas E. Bourquin, deceased, late of Savannah, Ga., and by Maggie B. Sanders, executrix, 2806 Clairborne Rd., Huntsville, Ala. 35810

Filed Oct. 3, 1977, Ser. No. 838,587
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—53.5 **2 Claims**

1. The method of removing a fish from a fishhook by an extractor wherein:

the extractor comprises:

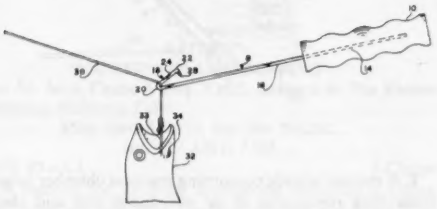
a handle,

a rod of $\frac{1}{8}$ to $\frac{1}{4}$ inch in thickness having a straight portion

extending from said handle and a hook-shaped end region generally lying in a plane with said straight portion, said hook-shaped end region formed by first and second spaced bends in said rod and wherein:

said first bend forming said straight portion an acute angle, and said second bend spaced along said rod ¼ to 1 ¼ inches from said first bend, and said second bend turning at an angle of approximately 90° in the same direction as said first bend, and

an extreme end region of said rod extending from said second bend toward and within ¼ to ¼ inch of said straight portion of said rod, and the inward side of the hook — shaped region provided by said extreme end region of said rod being turned slightly inward, at least at its end, whereby a fishing line under tension are sliding against the inner side of the rod between bends would be blocked from exit from the hook — shaped



region, but a loose line may be freely removed from said hook — shaped region,

by the steps comprising:

grasping said handle in one hand and said fishing line in the other hand and moving said hook — shaped region into the mouth of the fish and around the fishhook and moving the hands apart, causing the fish to be suspended by the fishing line and extractor, and

then moving the hands in generally parallel planes in a circular motion about a generally horizontal axis, said circular motion being in a direction, whereby the hook member is rotated upward, inside, between said axis and the body of the operator, over said axis, and downward on the outside of the axis, whereby a hooked fish is rotated in the same direction of rotation, and when near the bottom of the arc of rotation, the fishhook and fish separate by virtue of the described motion and weight of the fish.

4,127,958

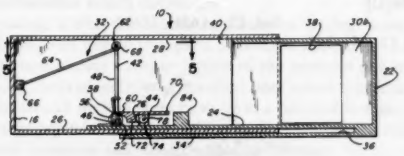
MOUSE TRAP

John Peters, P. O. Box 548, and Edward E. Thompson, P. O. Box 134, both of Norwood, Colo. 81423

Filed Jul. 8, 1977, Ser. No. 813,804

Int. Cl.² A01M *23/20*

U.S. Cl. 43—81 **10 Claims**



1. A mouse trap device comprising in combination:

first housing means having an open end therein,

second housing means slidably connected to said first housing means and movable between open and closed positions,

passage means providing access to the interior of at least one of said first and second housing means when said second housing means is in its open position, said first and second housing means cooperating to block said passage when said second housing means is in its closed position, and

releasable spring biased means in one of said housing means operable upon release to deliver a striking blow to a mouse, said spring biased means being operably connected to at least one of said housing means to move said second housing means to its closed position when said spring biased means is released.

4,127,959

LOW IMPACT ANIMAL TRAP

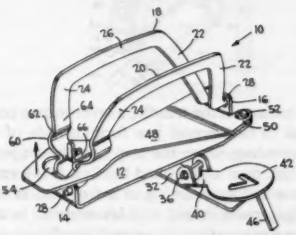
Herbert H. Loeffler, Cambridge, Mass., assignor to Woodstream Corporation, Lititz, Pa.

Division of Ser. No. 660,387, Feb. 23, 1976, Pat. No. 4,065,871.

This application Jul. 13, 1977, Ser. No. 815,451

Int. Cl.² A01M *23/24*

U.S. Cl. 43—88 **3 Claims**



1. In an animal trap of the leghold type having a base, a pair of U-shaped coacting jaws swingably mounted on said base, spring means biasing said jaws to a closed position, and trigger means for locking said jaws in an open position until released, the improvement comprising means for reducing the impact of said jaws when they close without significantly reducing the closing speed or holding power, said base being elongated and having upstanding first and second ears at the ends thereof; said jaws each comprising a pair of substantially parallel spaced legs and a cross member, said legs terminating in laterally outwardly directed pintles journalled through bores in said ears; said spring means being a leaf spring and comprising an eye at one end thereof, said eye encircling one leg of each jaw so that when said jaws are in the open position and said spring is released the eye thereof rides up said one leg of each jaw to thereby close said jaws, said impact reducing means comprising escapement means, said escapement means comprising said one leg of each jaw being offset inwardly toward the other at one portion thereof, and a cross-bar through said eye of said spring and passing between said one leg of said jaws, whereby when said trigger is released said spring moves along said one leg to close said jaws, when said spring reaches the offset portion of said legs, the direction of travel of said legs is momentarily reversed, and when said spring passes said offset portion of said legs said jaws resume their original direction of travel to thereby close with reduced impact.

4,127,960

TRIGGER FOR ROTATING FRAME TRAPS

Frank Conibear, Victoria, Canada, assignor to Woodstream Corporation, Lititz, Pa.

Filed Jan. 31, 1977, Ser. No. 764,271

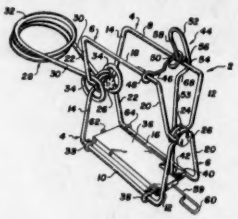
Claims priority, application Canada, Dec. 7, 1976, 267335

Int. Cl.² A01M *23/26*

U.S. Cl. 43—92 **19 Claims**

1. An animal trap having first and second similar frames each frame having first and second jaw forming sides that lie in a common plane and ends extending therebetween to support said jaw forming sides, said ends having a central portion in which the frames are pivotally connected through adjacent

ends for rotation about a common axis between set and closed positions and outer portions on each side of the central portion extending to said jaws, at least one actuator, capable of rapidly and forcefully effecting such rotation, which has two arms spring-biased at one end so that the other ends, which terminate in rings encircling adjacent ends of both frames on opposite sides of said axis, would,, if unobstructed, move apart to a distance substantially greater than the length of said frame ends, and a trigger means for releasably maintaining the trap in set position, said trigger means comprising a pivotally mounted treadle extending between the second jaw forming side of the first frame and the first jaw forming side of the second frame;



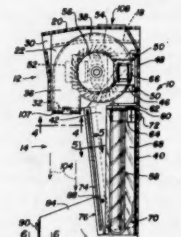
engagement means on the treadle; a lever means connected by a pivotal link to the second jaw forming side of the second frame and extending, when the trap is in the set position from said pivotal link over and around the first jaw forming side of the first frame and terminating in a free end in engagement with said engagement means, said lever means in the set position of the trap preventing the second jaw forming side of the second frame and the first jaw forming side of the first frame from moving apart under the influence of said actuator and the treadle in the set position being pivotally movable to release said free end of said lever means from said engagement means to release the trap from the set position.

4,127,961

APPARATUS FOR ENTRAPPING INSECTS

Dennis G. Phillips, Lititz, Pa., assignor to Pestolite Inc., Lancaster, Pa.

Filed Mar. 29, 1976, Ser. No. 671,367
Int. Cl.[2] A01M *1/08*
U.S. Cl. 43—139 **12 Claims**



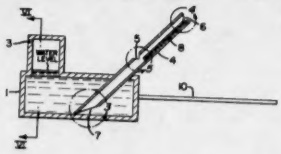
8. An apparatus for entrapping insects comprising a housing having upper and lower sections, air blower means in said upper section having a discharge portion for providing a direct, non-turbulent air curtain between said upper and lower sections, an ultraviolet light source disposed between said upper and lower sections and rearwardly of said air curtain to attract said insects toward said air curtain, collecting means directly below said discharge portion and defining an open chamber, and cannister means having a tacky surface and including means for attaching said cannister means to said collecting means for enclosing said open chamber and providing an enclosed terminus for said air curtain to receive and trap said insects therein.

4,127,962

WHISTLE HAVING ANGULARLY JOINED CYLINDRICAL CHAMBERS

Rurico Arzola, Calle San Martin, No. 69-Urb. Villa Sol, Mayaguez, P.R. 00708

Continuation-in-part of Ser. No. 600,503, Jul. 31, 1975. This application Apr. 7, 1977, Ser. No. 785,524
Int. Cl.[2] G10K *5/00*
U.S. Cl. 46—179 **16 Claims**



1. A musical whistle comprising resonant chamber means for controlling resonances of air introduced into said chamber means,

wherein said resonant chamber means includes a first elongated cylindrical chamber, said first chamber having a cylindrical wall being closed at opposite ends, and a truncated cylindrical chamber mounted in communication with said first chamber through a part of said cylindrical wall, said truncated chamber having a small aperture communicating the interior with the exterior; and

means for introducing air pulses into said resonant chamber means to produce mimicking sounds of birds,

wherein said means for introducing air pulses includes an elongated tubular member extending through said cylindrical wall of said first chamber to near an opposite interior cylindrical wall of said first chamber, said tubular member being open at respective ends, and including an intermediate aperture exterior to said first chamber, and said tubular member including an elongated member extending within said tubular member from the exterior open end to said intermediate aperture.

4,127,963

TOY DRAWING DOLL

Hisashi Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 18, 1976, Ser. No. 742,880
Claims priority, application Japan, Apr. 16, 1976, 51-48556[U]
Int. Cl.[2] A63H *33/24*
U.S. Cl. 46—265 **15 Claims**

1. A toy drawing doll, comprising:

a doll having a torso, a first arm movably mounted to said

torso for holding a drawing instrument, and a second arm mounted to said torso;

a platform having a rotatably mounted plate thereon for holding a medium to be drawn on;

a motor within said torso hidden from view;

means operatively connecting said first arm and said motor to move said first arm with respect to said torso such that the drawing instrument to be held by said first arm moves in relationship to said plate of said platform; and means operatively connecting said motor and said plate through said second arm so as to be hidden from view for rotating said plate and the drawing medium to be carried thereby, such that the design imparted by the drawing instrument to be carried by said first arm on the medium to be carried by said plate is the result of both the movement of said first arm and the movement of said plate.

4,127,964

MUSHROOM COMPOSTING

Henry M. Mee, Castro Valley, Calif., assignor to The Kinoko Company, Oakland, Calif.

Filed Nov. 8, 1976, Ser. No. 739,392
Int. Cl.[2] A01G *1/04*
U.S. Cl. 47—1.1 **5 Claims**

1. A method for growing mushrooms requiring a casing which comprises preparing a growth medium bed comprising pasteurized mixture of a cold manure and a naturally occurring colloidal particle having a significant amount of humic acid, and prepared by combining about 1 part by weight of said cold manure with from about 0.5 to 1 part by weight of said naturally occurring collodial particle matter and from about 50 to 70 weight percent based on the dry mixture of water and pasteurizing said mixture at a temperature from about 35° to 120° C for a period of from about 0.5 to 4 hrs;

inoculating said bed with spawn;

incubating said inoculated mixture for up to three weeks at a temperature of about 20° to 25° C;

applying a casing to said composting bed; and

maintaining said case mixture at a temperature of about 18° +/−2° C to produce fruiting bodies.

4,127,965

METHOD FOR GROWING WOOD MUSHROOMS

Henry M. Mee, Castro Valley, Calif., assignor to The Kinoko Company, Oakland, Calif.

Filed Nov. 8, 1976, Ser. No. 739,393
Int. Cl.[2] A01G *1/04*
U.S. Cl. 47—1.1 **21 Claims**

1. A method for preparing an article useful for the growth of tree mushrooms which comprises:

preparing a tree mushroom substrate by mixing water in from about one to two parts by weight per part of a dry mixture having a major portion of the particles of a naturally derived cellulosic material and minor portions of starch and protein sources to form a permeable mass;

introducing said substrate into a flexible container, sealing said container and sterilizing said substrate;

while in said container, inoculating said substrate with tree mushroom spawn and incubating said inoculated substrate under substantially asceptic conditions, at least initially while in a form for a time sufficient to allow substantial permeation of the mycelial from said spawn throughout said substrate to provide a formed article; and

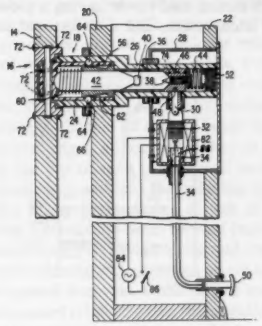
removing said container from said form to provide a formed article capable of producing fruiting bodies.

4,127,966

LOCKING AND EMERGENCY RELEASE SYSTEM FOR BARRED WINDOWS

Oscar W. Schmidt, Hesperia, Calif., assignor to New Pneumatics, Inc., Greeley, Colo.

Filed Aug. 22, 1977, Ser. No. 826,535
Int. Cl.[2] E06B *9/02*
U.S. Cl. 49—141 **6 Claims**



1. A locking and emergency release system for barred windows or doors comprising:

a movable burglar-proof barrier for a window or door;

positive and rigid mechanical latching means for normally locking said barrier into its closed position across a window or door in a building;

said latching means including movable piston means located in a cylinder, constituting first and second telescoping mechanically interlocking means secured to the barrier and the building;

a cannister of pressurized gas mounted in said cylinder;

actuating means, including cannister piercing means for releasing said gas, and for unlocking said positive mechanical latching means and moving said barrier away from said window or door with said gas applying opening force to said barrier, to permit egress from said building;

said actuating means including a plunger telescopically enclosed within said cylinder;

spring means for supplying actuating force to said actuating plunger;

detent means for restraining said plunger against movement; and

manual or electrical means for releasing said detent means to thereby release said actuating means to unlock said latching means, pierce said cannister of gas and apply opening force to said barrier.

4,127,967

BURGLAR-RESISTANT DOOR ASSEMBLY

Gertrude K. Franzl, 105-25 65th Ave., Forest Hills, New York, N.Y. 11375

Filed Oct. 6, 1976, Ser. No. 730,132
Int. Cl.[2] E06B *7/28*
U.S. Cl. 49—171 **4 Claims**

1. Improved burglar-resistant door assembly, said assembly comprising, in combination:

a. a door frame;

b. a door hingedly connected to one side of said frame;

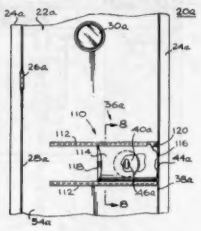
c. door latch means connected to the inside surface of said door;

d. a peephole device extending through said door;

e. a protective cover device releasably disposed over said latch means on the inside surface of said door so as to prevent tampering with said latch means from outside said door, said cover device having a top portion, two oppositely disposed sides, one closed end integral with said top

portion, and a completely open end disposed opposite said closed end;

f. wherein said cover device comprises a pair of spaced parallel tracks mounted on said door inner surface on opposite sides of said latch means and running from about the edge of said door containing said latch means to a location past said latch means and away from said door edge, and a cover slideably mounted on said tracks over said latch means, said cover having a closed face overlying said latch means, and a closed end and an opposite



open end, the latter end facing toward said door edge and the portion of said door frame adjacent said door edge;

g. wherein said open cover end extends to about said door edge and wherein said track is of sufficient length to permit said cover to be slid therealong away from said door edge to expose said latch means; and

h. wherein said cover device includes a hood adjacent the end of said tracks near said door edge and extending over and around said open cover end to prevent tampering therewith.

4,127,968

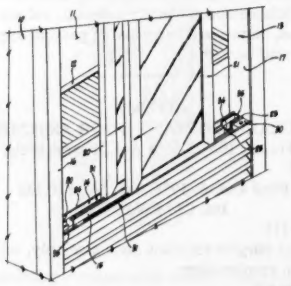
DEBRIS-COLLECTING ASSEMBLY FOR SLIDING DOOR TRACK

James A. Trulaske, St. Louis, Mo., assignor to True Manufacturing Co., Inc., O'Fallon, Mo.

Filed Apr. 27, 1978, Ser. No. 900,436

Int. Cl.[2] E05D *15/06*

U.S. Cl. 49—404 **11 Claims**



1. A debris-collecting assembly, comprising:

(a) a door frame including an elongate lower channel,

(b) a door slidably mounted in the channel for movement between open and closed positions, and

(c) a top-open pan removably located in the channel, the pan being open at one end to receive debris swept along the channel when the door is in its open position, and to receive the door in its closed position.

4,127,969

METHOD OF MAKING A SEMICONDUCTOR WAFER

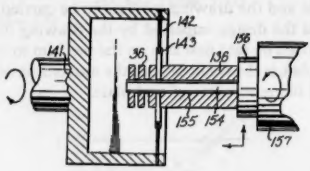
Kinji Hoshi, Sagamichoro, and Kazuhiro Sugita, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 178,732, Sep. 8, 1971, abandoned. This application Dec. 11, 1975, Ser. No. 639,806

Claims priority, application Japan, Sep. 8, 1970, 45-78583; Sep. 8, 1970, 45-96065

Int. Cl.[2] B24B *1/00*; Feb. 5, 1971, 46-4885

U.S. Cl. 51—283 R **12 Claims**



1. The method of making a semi-conductor wafer, said method comprising the steps of:

mounting on a rod a semi-conductor ingot having a longitudinal hole extending at least part way longitudinally through said ingot;

temporarily adherently joining said ingot to said rod to form a unitary structure without slippage between said ingot and said rod;

providing relative rotation between said unitary structure and a cutting edge to slice said ingot through to said hole from all radial directions to form a wafer having smooth surfaces, said wafer still being adherently attached to said rod after both main surfaces of said wafer have been formed by such slicing; and subsequently removing said wafer from said rod.

4,127,970

SUSPENDED FLEXIBLE CONTAINER

Wolfgang Reichert, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Walter Krause, Waldheim, Fed. Rep. of Germany

Filed Nov. 2, 1976, Ser. No. 738,237

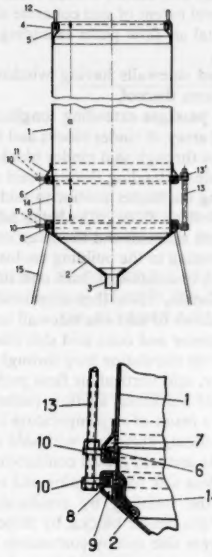
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550526

Int. Cl.[2] E04H *7/24*; E04B *1/12, 1/347*

U.S. Cl. 52—63 **9 Claims**

1. An arrangement for pretreating suspended flexible containers of the type including an upper tubular part of flexible material and a rigid lower bottom part, comprising: means for suspending said container by an upper edge portion of said upper tubular part; pulling means for pulling a lower edge portion of said upper tubular part in a longitudinal direction towards said lower bottom part, and for subsequently fixedly connecting said lower edge portion of said upper tubular part to said lower bottom part; first means for connecting said pulling means to said upper tubular part, said first means including an upper pocket-shaped member connected to said lower edge portion of said upper tubular part and having openings with substantially horizontal axes, a circumferentially closed upper reinforcing member extending through said upper pocket-shaped members, and projections fixedly con-

nected to said upper reinforcing member and extending through said openings, said projections having upper bores



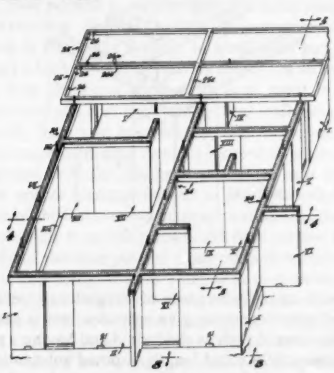
with substantially vertical axes; and second means for connecting said pulling means to said lower bottom part.

4,127,971

BUILDING CONSTRUCTED OF PRECAST L-SHAPED CONCRETE UNITS

Agustin Rojo, Jr., Paseo del Parque Z-12, Garden Hills, Bayamon, P.R.

Filed May 16, 1977, Ser. No. 797,292
Int. Cl.[2] E04H *1/12, 9/06*
U.S. Cl. 52—79.11 **6 Claims**



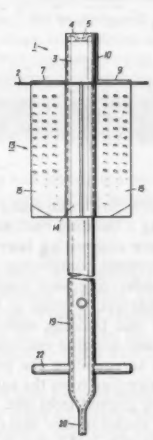
1. A building comprising a concrete foundation having reinforced footings with L-shaped seats arranged in a predetermined floor plan for positioning roof supporting structural walls, a plurality of concrete L-shaped units, each precast as a vertical freestanding structure formed with right angular wall sections each having a cutout extending as a recess from the bottom edge thereof, one of said L-shaped units being positioned on each of said seats, a first tie rod precast and embedded in each of said wall sections and having a threaded end extending vertically downwardly into each of said cutouts, a second tie rod embedded in said foundation having a threaded end extending vertically above each of said seats into each of said cutouts in predetermined relation to said first tie rods, bracket and tightening means located within said cutout interconnecting said threaded ends of said first and second tie rods as anchoring means securing each unit to the foundation, said L-shaped units being arranged according to said floor plan in groups whereby one of said walls sections of the L-shaped units in each group are aligned in coplanar relation defining one of said roof supporting structural walls, a metal H-beam extending the length of each of said structural walls as an upper coplanar border, the top edges of the wall sections extending into the downfacing channel of said H-beam with the cross-piece resting on said edges, a third embedded tie rod vertically extending from the top of each of said wall sections through said H-beam cross-piece and into the upfacing trough thereof, poured concrete filling the upfacing trough of each of said H-beams forming a composite beam for said building, a plurality of fourth vertical tie rods spaced along said composite beam embedded in said concrete and extending above said H-beam at predetermined spaced intervals, a plurality of roof slabs, each precast as an elongated relatively thin rectangular body having a flat bottom side resting on said composite beams and thickened peripheral borders projecting above the top side thereof and having interior sides, said roof slabs being located in longitudinal side-by-side relation with said fourth tie rods extending between said peripheral borders of adjacent roof slabs, elongated strips extending along each pair of adjacent peripheral borders and having a cross-sectional contour to fit against the two adjacent borders and the interior sides thereof, said fourth tie rods having threaded ends extending through openings formed in said elongated strips and being engaged by nuts tightening against the strips anchoring said roof slabs to said composite beams.

4,127,972

MEANS FOR MARKING OF POINTS WITHIN THE TERRAIN

Fritz Reimoser, Klammstrasse 21, Weiz, Austria (8160)

Filed Feb. 17, 1977, Ser. No. 769,751
Claims priority, application Austria, Feb. 17, 1976, 1097/76
Int. Cl.[2] E01F *9/02;* **G01C** *15/02*
U.S. Cl. 52—103 **11 Claims**



1. A marking device for permanently indicating ground locations as for identifying surveying points, paths and the like, said device comprising a marking element and an anchoring element, said marking element including a first component and a second component, said first component having a disc-like

flange and said second component having a central tubular hug and a plurality of circumferentially spaced flaps extending radially outwardly from said hub, said disc-like flange positioned above and supported by upper edges of said flaps such that said first and second components of said marking element are longitudinally positioned with respect to each other and said flaps longitudinally extend in a direction normal to the plane of said flange, said disc and said flaps presenting planar surface portions having identifying indicia permanently formed thereon whereby particular indicia may be permanently delineated on said surface portions such that extensive information concerning the ground location so marked may be conveyed to an observer of said device, and means for fixing the relative longitudinal and rotational position of said flange with respect to said flaps such that the information permanently delineated on said planar surface portions of said disc and said flaps may be interrelated, said anchoring element having a generally tubular body over which each of said components is adapted to be disposed with upper portions of the tubular body of said anchoring element disposed within said central tubular hub of said second component such that said marking element is supported by said anchoring element such that said device when said anchoring element is positioned in the ground may identify surveying points and the like.

4,127,973

SOLAR-HEATED CONCRETE SLAB BUILDING STRUCTURE

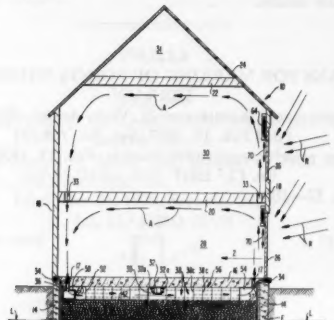
James Kachadorian, Royalton, Vt. 05068

Continuation of Ser. No. 782,811, Mar. 30, 1977, Pat. No. 4,089,142. This application Feb. 28, 1978, Ser. No. 881,942

The portion of the term of this patent subsequent to May 16, 1995, has been disclaimed.

Int. Cl.[2] E02D *27/32*; F24H *7/00*

U.S. Cl. 52—169.11 **1 Claim**



1. In a building structure comprising a building structure foundation supporting a building enclosure mounted thereon, said building enclosure comprising laterally spaced, opposed sidewalls, the improvement comprising:

a concrete slab underlying said building structure, being within said foundation, forming at least a portion of the ground floor of said building structure and being interposed between said building enclosure and the ground,

thermal insulation surrounding the periphery of said concrete slab and extending from the surface of the ground to a level below the ground frost line,

an array of hollow cinder blocks, said cinder blocks underlying said concrete slab, and being in situ with said slab,

a layer of gravel interposed between said cinder blocks and the ground and extending below the frost line such that the gravel forms in addition to the concrete slab and cinder blocks a portion of a composite three layer heat sink,

said array of hollow cinder blocks comprising generally parallel rows of end-to-end abutting generally axially aligned hollow cinder blocks, forming multiple horizontal air flow paths through said cinder blocks directly beneath said concrete slab, said cinder blocks extending substantially the full lateral extent of said concrete slab, with said multiple horizontal air flow paths extending transversely of said sidewalls,

one of said opposed sidewalls having windows extending over substantial area thereof,

means defining air passages extending longitudinally along both ends of said array of cinder blocks and being open to the air flow paths through said cinder blocks,

vertical air flow paths extending through said concrete slab from said building enclosure interior to said air passages, one of said vertical air flow paths being adjacent to the interior of said one sidewall and the other of said vertical air flow paths opening to the building enclosure at a point remote from said one sidewall, said one sidewall facing major solar radiation, such that direct solar radiation through the windows of said one sidewall into said building enclosure interior and onto said slab causes a natural thermal siphonic air circulation loop through said building enclosure interior, said vertical air flow paths within said solar slab and said horizontal air flow paths through said cinder blocks as a result of air temperature differential set up within said building enclosure with said concrete slab, said cinder blocks and said gravel constituting a low thermal impedance heat sink for reception and release of heat transmitted to the building by conduction from the ground through the cinder blocks, by direct solar radiation of the concrete slab and by convection of air passing over the concrete slab with said heat sink effectively storing heat during solar radiation of said building structure but remaining at a temperature less than that of said building enclosure interior.

4,127,974

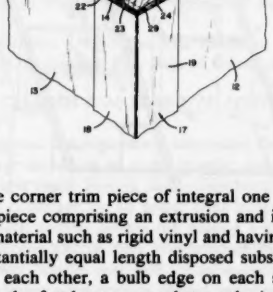
OUTSIDE CORNER TRIM FOR BUILDING

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed May 5, 1977, Ser. No. 794,194

Int. Cl.[2] E04C *2/38*

U.S. Cl. 52—288 **1 Claim**



1. An outside corner trim piece of integral one piece construction, said piece comprising an extrusion and is extruded from a plastic material such as rigid vinyl and having a pair of flanges of substantially equal length disposed substantially at right angles to each other, a bulb edge on each said flange defining the depth of at least one pocket on the inner side of each flange, a flange projecting inwardly at substantially right angles from one of said first-named flanges, and a pointed barb on the free end of the inwardly projecting flange having sharp shoulders projecting up on opposite sides of the last-named flange said pointed barb of said inwardly projecting flange entering an opening betweeen an edge of a wall member and an adjacent inside face of an adjacent wall member at an outside building corner and said sharp shoulders holding the barb

against withdrawal to retain the corner trim piece in position, and wherein said corner trim piece includes mastic cement in said pockets adhering said corner trim piece to the supporting outside building corner surface.

4,127,975

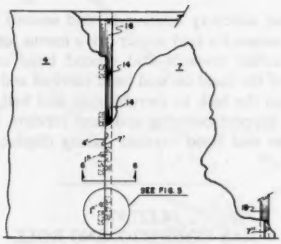
CONCEALED FASTENERS FOR WALL PANELS

Thomas Judkins, 116 W. University Pkwy., Baltimore, Md. 21210

Continuation of Ser. No. 705,517, Jul. 15, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 828,097

Int. Cl.[2] E04B *5/52*

U.S. Cl. 52—489 **2 Claims**



1. A modular wall construction comprising in combination, at least first and second parallel mounted panel boards, an associated wall supporting stud extending along the line of jointure between the panel boards and a plurality of fasteners for mounting each of said panel boards to said wall support stud, each said fastener comprising a continuous main base portion having a width equal to the width of the fastener, an extension portion extending outwardly from a central portion of the base portion in substantially the same plane therewith, said extension portion having an aperture therethrough adapted to attach the fastener to a said stud and including an end part which extends outwardly therefrom and which is bent away from the plane thereof so as to assist in guiding the fastener into place, at least one vertical wall section extending upwardly from said base portion and including at least one pointed panel engaging element located in a place parallel to and spaced from the said base portion, at least one integrally formed spacer element formed at least partially in the base portion of the fastener at a central location therein and extending outwardly from the plane of the base portion on the opposite side of the base portion from the pointed panel engaging element and being of such a depth as to provide a space between the panel board and the stud, said plurality of fasteners comprising at least two said fasteners each of which is secured to said first panel board by the said pointed panel engaging element thereof and is attached to said stud by securing means extending through the aperture in said extension portion of said main base portion and at least one further said fastener secured to the second panel board by the pointed panel engaging element thereof with the extension portion of the main base portion thereof being unconnected to said stud and being received in the space between the first panel board and the stud, provided by the spacer elements of said two fasteners secured to said first panel board, so as to constitute the tongue of a tongue and groove arrngement.

4,127,976

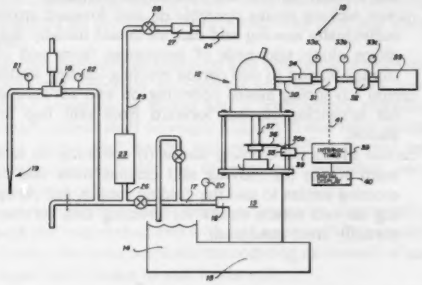
METHOD AND APPARATUS FOR MAKING DUAL COMPARTMENT CONTAINERS

Charles E. Jablonski, and John W. Kreiger, both of Bethlehem, Pa., assignors to Atlas Powder Company, Dallas, Tex.

Filed Aug. 24, 1977, Ser. No. 827,154

Int. Cl.[2] B65B *9/12, 57/14*

U.S. Cl. 53—450 **2 Claims**



1. In an apparatus for making a dual compartmented container and loading a high viscosity fluid which is subject to fluctuations in viscosity in one compartment and a second fluid in the second compartment, the apparatus comprising:

means for directing a continuous web of pliable material having first and second longitudinal edges to a forming anvil,

means for folding the first edge of said web onto the remainder of said web to form a two-ply side portion,

means for forming said web into a continuous tube with the overlying flap of the two-ply portion facing outwardly and with the second edge of said web overlying the side portion,

means for attaching the first edge of said web to the web adjacent therebelow forming a first compartment and for attaching the second edge of said web to the outer layer of the two-ply margin along a second seam to form a dual compartmented tube from said web,

an air driven pump for pumping a high viscosity fluid from a storage location into said second compartment,

an air supply communicating with said pump to drive said pump,

a timer for measuring the cycle speed of said pump,

means for varying the pressure from said air supply to said pump in response to changes in cycle speed occasioned by fluctuations in viscosity of said high viscosity fluid to thereby maintain a constant output of said high viscosity fluid,

means for loading a second fluid into said first compartment, and

means for gathering and sealing the compartments at spaced lengths along the longitudinal lengths thereof.

4,127,977

CARTON HANDLING AND ERECTING MACHINE

Herbert F. Roehn, Prospect Heights, Ill., assignor to SMW Packaging Corporation, Prospect Heights, Ill.

Filed Oct. 11, 1977, Ser. No. 840,720

Int. Cl.[2] B65B *43/32*

U.S. Cl. 53—565 **14 Claims**

12. A packaging machine for packaging articles into cartons said cartons having walls and flaps, said walls being joined along first intervening fold lines and pairs of said flaps being joined to opposed ends of said walls along second intervening fold lines, said cartons being folded about said first and second intervening fold lines to an initially flat condition,

said improved machine comprising, in combination:

a frame having ways defining an axis and an axial path for

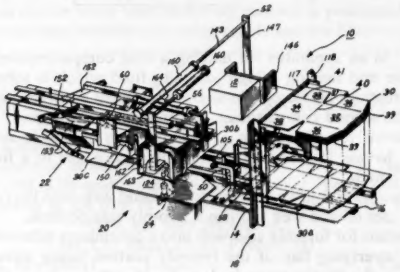
movement of said cartons with stations therealong, said stations including a carton storage station, a carton erecting-loading station forward of said storage station, and a flap folding station forward of said carton erecting-loading station;

an intermittently actuable and axially reciprocating carton advancing-erecting mechanism mounted on said frame, said mechanism reciprocating through a forward stroke and a return stroke, said mechanism including

carton pick-up means operable on said forward stroke for individually moving said cartons in said initially flat condition along said path of movement from said carton storage station to said carton erecting-loading station,

carton advancing means operating on said forward stroke for advancing cartons forward from said flap folding station,

carton advancing-erecting means (i) operating on said forward stroke for moving said cartons from said carton erecting station to said flap folding station, and (ii) operating on said return stroke for erecting said cartons to a partially erect condition;



flap separating means for separating at least one of said flaps as said cartons are moved to said carton erecting-loading station, said flap separating means attached to said frame between said carton storage station and said carton erecting-loading station in the path of movement of said flaps;

intermittently actuable clamping means for clamping the separated flap of cartons stationed at the carton erecting-loading station to substantially prevent linear and rotational movement of one of said walls, said clamping means attached to said frame at said carton erecting-loading station;

intermittently actuable final carton erecting means for erecting said cartons stationed at said carton erecting-loading station from said partially erect condition to a fully erect condition, said loading means attached to said frame at said carton erecting-loading station;

intermittently actuable loading means for loading said articles into said cartons in said fully erect position at said carton erecting-loading station, said loading means attached to said frame at said carton erecting-loading station; and

flap folding plows attached to said frame at said flap folding station for folding the flaps of said cartons.

4,127,978

DEVICE FOR PLACING A BAND ON A BALL

Florian Lucke, Mengen, Fed. Rep. of Germany, assignor to Croon & Lucke Maschinenfabrik GmbH & Co. KG, Fed. Rep. of Germany

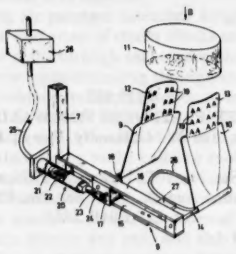
Filed May 9, 1977, Ser. No. 794,994

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620690

Int. Cl.[2] B65B *13/00, 27/06*

U.S. Cl. 53—585 **7 Claims**

1. In a device for placing a ring-shaped band on a ball of yarn or the like wherein the band is placed on the ball by means of a first and a second band carrier mounted on a support which is displaceable with respect to the ball, the ball being held between the band carriers, the improvement comprising a guiding slideway on said support, means slidably supporting said first band carrier in said slideway, means rigidly attaching said second band carrier to said support, biasing means normally urging said first band carrier away from said second band carrier, power drive means reciprocating said first band



carrier in said slideway relative to said second band carrier, and control means for said power drive means for moving said first band carrier towards said second band carrier during application of the band on said band carriers and after placing the band onto the ball, to thereby grip said ball, by displacement of said support carrying said band carriers, the ball being held between said band carriers during displacement of the support.

4,127,979

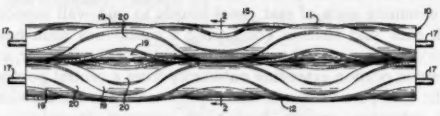
HAY CONDITIONING ROLL

Manfried L. Hoch, Romeoville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 24, 1977, Ser. No. 761,577

Int. Cl.[2] A01D *49/00*

U.S. Cl. 56—1 **6 Claims**



1. A hay conditioning roll comprising an elongated cylindrical elastomeric body having a plurality of substantially equally circumferentially spaced elastomeric ribs extending continuously across the axial length of the body, said ribs comprising an interconnected series of alternately inverted arcuate shapes having a slope relative to the axis of said roll reversing from positive to negative at least once across the axial length of said roll, the absolute value of said slope gradually decreasing to zero, passing therethrough, and gradually increasing upon approaching and passing the point of reversal such that lateral accumulation of crops at the points of reversal is avoided.

4,127,980

CROSSFLOW MOWER WITH AUTOMATIC BRAKE/SHARPENER

Hugo S. Ferguson, c/o Duffers Associates, Inc., Box 85, R.D. 5, Troy, N.Y. 12180

Continuation-in-part of Ser. No. 741,132, Nov. 11, 1976. This application Jul. 29, 1977, Ser. No. 820,226

Int. Cl.[2] A01D *69/08, 75/08*

U.S. Cl. 56—11.3 **6 Claims**

1. A mower of the cross-flow blower type comprising

(a) a carriage,

(b) a cylindrical rotor mounted on said carriage with the axis

thereof substantially horizontal and extending laterally of the carriage,

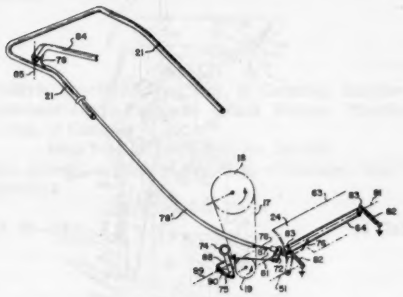
(c) said rotor having one or more sections along the axis thereof with a plurality of circumferentially-spaced approximately helical fixed blades in each section moving in the same path of travel and spaced from the rotor axis to leave the major portion of the interior of the rotor free for air flow through the rotor transversely thereof,

(d) motor means for driving said rotor,

(e) the outer leading edges of the blades being sharp to form cutting edges and the cross-section of the blades having at least a portion on the leading side thereof which slopes backwardly and inwardly with respect to the direction of rotation of the rotor,

(f) a blower conduit cooperating with said rotor to form therewith a cross-flow blower,

(g) said conduit comprising two wall sections extending laterally along the length of the rotor and having respective portions close to the rotor at circumferentially spaced positions separating inlet and outlet regions of the blower,



(h) said inlet region opening downwardly and forwardly with a portion of the rotor therein exposed to material to be mowed,

(i) the portions of the mower adjacent the rotor being nonshearingly spaced from the path of travel of said blades during moving operation,

(j) clutch means for engaging said motor means with said rotor and disengaging the motor means therefrom,

(k) one of said wall sections of the conduit having an abrasive panel facing said rotor,

(l) means mounting said abrasive panel for movement between a mowing position in which the panel is spaced from the rotor and a brake/sharpening position in which the panel is contacted by the rotor blades,

(m) and means for automatically moving said abrasive panel to said brake/sharpening position when said clutch means is disengaged and to said mowing position when the clutch means is engaged.

4,127,981

DRIVE MEANS FOR A CROP HARVESTING MACHINE

Charles A. Parrish, New Holland, and Bryant F. Webb, Ephrata, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Jan. 17, 1977, Ser. No. 759,708
Int. Cl.[2] A01D *41/02*
U.S. Cl. 56—14.4 **9 Claims**

1. A crop harvesting machine, comprising:

a mobile frame adapted for movement across a field in a forward direction, said frame including a main portion extending transversely to said forward direction and a side portion;

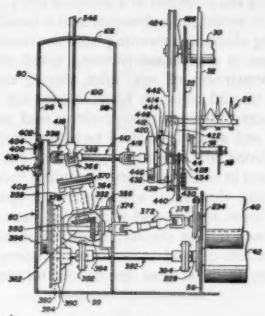
an elongated header suspended from said mobile frame so as to be vertically movable relative to said mobile frame and disposed in transverse relationship to said forward direction forwardly of said transverse main frame portion and laterally adjacent said side frame portion, said header operatively mounting means for severing and delivering crop from the field to rearwardly of said header;

a pair of upper and lower elongated conditioner rolls rotatably mounted on said main portion of said mobile frame so as to be disposed in transverse relationship to said forward direction rearwardly of said header, said rolls being operable for receiving crop delivered rearwardly of said header and conditioning said delivered crop, said upper roll being mounted for movement toward and away from said lower roll;

a gearbox assembly mounted on said side frame portion and including generally fore-and-aft extending rotary input drive transmission means and a transversely extending rotary output shaft drivingly coupled to said input means, said output shaft having one end extending toward said conditioner rolls and an opposite end extending away from said rolls;

upper telescopible shaft means articulately intercoupling said one output shaft end with said upper roll for rotatably driving the latter while accommodating movement of said upper roll relative to said lower roll;

gear means mounted on said side frame portion and on said



opposite end of said output shaft and extending downwardly thereform;

lower transversely extending shaft means drivingly intercoupling a lower portion of said gear means with said lower roll, said gear means, in turn, drivingly intercoupling said lower transverse shaft means with said opposite end of said output shaft such that said lower roll is rotatably driven in a direction opposite to that in which said upper roll is driven by said one output shaft end;

drive mechanism on the side of said header adjacent said side frame portion for operating said severing and delivering means of said header;

drive transmission means mounted on said side frame portion and on said opposite end of said output shaft adjacent said gear means and extending generally forwardly therefrom; and

forward telescopible shaft means articulately intercoupling a forward portion of said drive transmission means with said drive mechanism on said header side for rotatably driving the latter for operating said severing and delivering means while accommodating movement of said header relative to said frame, said drive transmission means, in turn, drivingly intercoupling said forward shaft means with said opposite end of said gearbox assembly output shaft.

4,127,982
METHOD OF AND AN APPARATUS FOR MANUFACTURING A SZ TWISTED STRAND OF ELONGATED ELEMENTS FOR TELECOMMUNICATION CABLES

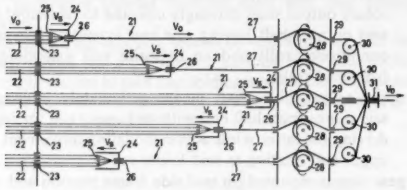
Dieter Braun, Bergisch Gladbach, and Hugo Cramer, Cologne, both of Fed. Rep. of Germany, assignors to Felten & Guilleaume Kabelwerke GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 21, 1977, Ser. No. 844,425

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648140; Oct. 26, 1976, 2648368

Int. Cl.[2] H01B *13/04;* **D07B** *3/00*

U.S. Cl. 57—294 **22 Claims**



5. An apparatus for manufacturing an SZ-twisted strand of elongated elements for use in cables, particularly telecommunication cables, comprising means for advancing the elements at a constant advancement speed along a path; a spacing element for maintaining the elements at a distance from one another; an inlet nipple for joining the elements into a bundle downstream of said spacing element; a twisting head for twisting the bundle into the strand at a constant twisting speed and in the same direction downstream of said inlet nipple; an outlet nipple downstream of said twisting head; means for mounting said spacing element for displacement along said path in a trajectory toward and away from said twisting head between two terminal positions; and means for cyclically reciprocating said spacing element in said trajectory, including means for displacing said spacing element at a displacement speed lower than said advancement speed, and means for increasing said displacement speed during the displacement of said spacing element in a section of said trajectory commencing at, and in direction away from, at least one of said terminal positions.

4,127,983
YARN GUIDING AND THREADING MECHANISMS FOR USE WITH TEXTILE YARN PROCESSING MACHINES

Gert Munker, Krefeld, Germany, assignor to Palitex Project Company GmbH, Krefeld, Germany

Filed Oct. 26, 1977, Ser. No. 845,719

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648621

Int. Cl.[2] D01H *15/00, 1/10*

U.S. Cl. 57—279 **29 Claims**

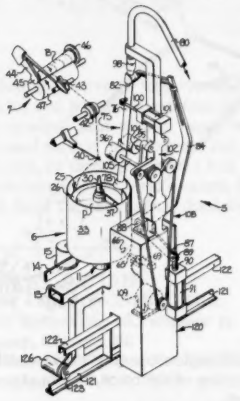
1. In a textile yarn processing machine, such as a two-for-one twister or the like, the combination of:

a plurality of spindle assemblies mounted in generally side-by-side relationship along the outside of said machine and each including a driven rotating rotor mechanism, a stationary carrier mechanism for carrying a hollow supply package of yarn and having a basket device surrounding the supply package, a balloon limitor device surrounding said basket device and providing a space therebetween, and an elongate yarn passageway extending downwardly through the top of said carrier mechanism along the axis of said spindle assembly and radially outwardly through said rotor mechanism into said space between said basket device and said balloon limitor for the passage of yarn from the supply package downwardly and outwardly through said passageway and upwardly through said space during yarn processing;

a processed yarn take-up assembly positioned above each of said spindle assemblies for forming a take-up package of processed yarn and including a cradle device having centering discs for carrying a driven take-up bobbin therebetween for the winding of processed yarn thereon;

selectively-operable pneumatic threading mechanisms for being operated to automatically thread a free end of yarn withdrawn from the supply package through said yarn passageway and through said space between said basket device and said balloon limitor during threading-up of said spindle assemblies by creating a suction through the yarn entry portion of said passageway and a positive air stream through the yarn exit portion of said passageway and through said space between said basket device and said balloon limitor; and

yarn guiding and threading means operatively associated with each of said spindle and take-up assemblies for being positioned generally at the front thereof and comprising a generally vertically-extending elongate tube having an air passageway therethrough and a source of suction connected to the upper end thereof for creating a suction therethrough for receiving at the lower end thereof the free end of yarn passing upwardly from between said basket device and said balloon limitor during pneumatic threading of said spindle assembly and for guiding the free end of yarn upwardly through said tube, a slot extending from the outside of said tube to said passageway along substantially the length thereof and positioned on the side thereof facing said spindle assembly for removal of the yarn from said tube, and a yarn carrier including means movably mounting said carrier for movement between a first position for engaging the yarn passing through said tube to a second position closely adjacent the take-up bobbin in said cradle device of said take-up assembly for conveying the yarn from said tube through said slot therein and positioning the yarn on the take-up bobbin to complete threading-up of said spindle assembly and said take-up assembly to eliminate manual handling of the yarn during threading-up operations.



4,127,984
SLIP MECHANISM OF CLOCK

Masuo Ogihara; Kozo Chimura, and Nobuo Shinozaki, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Feb. 28, 1977, Ser. No. 772,566

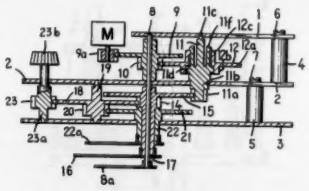
Claims priority, application Japan, Feb. 26, 1976, 51-22302[U]; Mar. 3, 1976, 51-25097[U]

Int. Cl.[2] G04B *13/02, 33/00;* **F16D** *7/02*

U.S. Cl. 58—7 **7 Claims**

1. A slip mechanism for a clock having a gear train, said slip mechanism comprising in said gear train a gear and a pinion

integral with a shaft coaxial with said gear, said gear and pinion having interengaging circular guide portions for centering and rotatively guiding said gear and pinion relative to one another, one of said gear and pinion having an annular circular friction surface concentric with said shaft and the other of said gear



and pinion being formed of plastic material in one piece with resilient finger means which extend axially therefrom and which resiliently, frictionally and radially engage said annular friction surface to frictionally couple said gear and pinion with one another.

4,127,985

WATCH

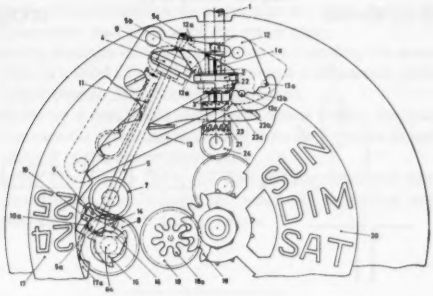
Kurt Mürrle, Pforzheim, Fed. Rep. of Germany, assignor to Pforzheimer Uhren-Rohwerke Rudolf Wehner, Pforzheim, Fed. Rep. of Germany

Filed Nov. 26, 1976, Ser. No. 745,053

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556314

Int. Cl.[2] G04B *19/24*

U.S. Cl. 58—58 **14 Claims**



1. A watch comprising
time-indicating means,
time-setting means operable to set said time-indicating means,
a setting shaft which is axially movable to first and second positions and arranged to be operatively connected to said time-setting means in said first position,
rotatable calendar-indicating means provided with a circular series of gear teeth,
a calendar-correcting pinion non-rotatably mounted on said setting shaft,
a calendar-correcting shaft, which extends at an angle to said setting shaft and has first and second end portions,
first and second pinions non-rotatably mounted on said calendar-correcting shaft on said first and second end portions thereof, respectively,
a mounting plate having an aperture in which said second end portion is mounted to permit of a pivotal movement of said calendar-correcting shaft toward and away from said setting shaft between an operative position, in which said first pinion is in mesh with said calendar-correcting pinion, and at least one inoperative position, in which said first pinion is disengaged from said calendar-correcting pinion,
a bias spring urging said calendar-correcting shaft to said operative position,
a bell-crank lever operatively connected between said setting shaft and said calendar-correcting shaft and arranged to hold said calendar-correcting shaft in an inoperative position against the action of said bias spring when said setting shaft is in said first position and arranged to permit said calendar-correctingshaft to assume said operative position when said setting shaft is in second position,
resilient detent means arranged to yieldably retain said bell-crank lever in positions corresponding to said first and second positions of said setting shaft, and
calendar-correcting means in mesh with said second pinion and adapted to mesh with said gear teeth.

4,127,986

PENDULUM CLOCK MECHANISM

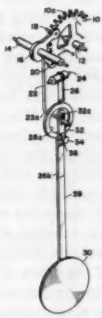
Kazutoshi Nozawa; Yasue Ashibe; Hatsuo Aruga, all of Kamiina, and Kunio Tatsuzawa, Ina, all of Japan, assignors to Rhythm Watch Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1976, Ser. No. 755,549

Claims priority, application Japan, May 1, 1976, 51-50374

Int. Cl.[2] G04B *17/16*

U.S. Cl. 58—134 **2 Claims**

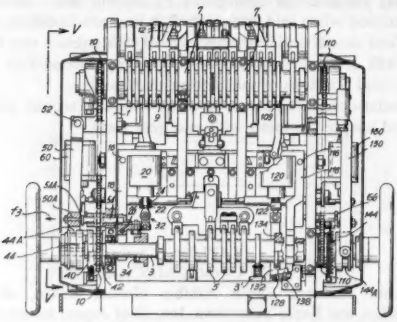


1. A clock mechanism comprising:
a pendulum;
an escape wheel having plurality of escape teeth disposed on the periphery of said escape wheel;
an anchor coupled to a rotatable pallet arbor and having two symmetrical pallet pins engageable with said escape wheel;
a swing rod coupled to said arbor;
a resilient swing member coupled to a pivot point at a first end and to said pendulum at a second end;
a pivot pin provided on said swing member;
a lever rotatably provided on said pivot pin at one end and coupled to said swing rod at the other end; and
a slip spring provided on said pivot pin and applying a compressive force on said lever such that said lever is frictionally held at some first angle relative to said pendulum and such that whenever a torque greater than predetermined magnitude is exerted on said lever, said lever rotates to and maintains a second angle relative to said pendulum,
whereby said escapement executes accurate time keeping motions without substantial dependence on alignment of said clock mechanism with the vertical as defined by gravity by automatically compensating for misalignments.

4,127,987
MACHINE FOR MANUFACTURING CHAINS HAVING DIFFERENTIATED LINKS

Ezio Tega, and Danilo Volpi, both of Arezzo, Italy, assignors to Metalmeccanica Gori & Zucchi MGZ S.p.A., Arezzo, Italy

Filed Mar. 28, 1977, Ser. No. 781,971
Claims priority, application Italy, Mar. 30, 1976, 9393 A/76
Int. Cl.[2] B21L *11/00*
U.S. Cl. 59—16 8 Claims



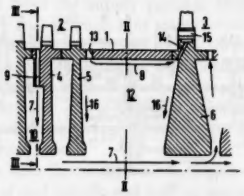
1. In a machine for manufacturing chains, a frame, a main camshaft and means for continuously rotating the same, first and second alternatively operable camshafts journaled for independent rotation in said frame, first chain-link forming mechanism operated by one of said alternatively operable camshafts, second chain-link forming mechanism operated by the other of said alternatively operable camshafts, further chain-link forming mechanism serving both said first and second forming mechanisms and operated by said main camshaft, each of said forming mechanisms having one link-forming cycle per revolution of said main camshaft, first and second electrically operated means associated with the respective alternatively operable camshafts for connecting a selected one to the exclusion of the other of said alternatively operable camshafts to said main camshaft, and program means connected to said electrically operative means and operative to determine a predetermined number of cycles of one of said alternatively operable camshafts in alternation with a predetermined number of cycles of the other of said alternatively operable camshafts, whereby in the circumstance of said first and second chain-link forming mechanisms being respectively set up to form chain links of different character, said program means will establish a predetermined pattern of successively formed chain links of different character.

4,127,988
GAS TURBINE INSTALLATION WITH COOLING BY TWO SEPARATE COOLING AIR FLOWS

Bernard Becker, Mulheim, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Jul. 20, 1977, Ser. No. 817,228
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633291
Int. Cl.[2] F02C *7/18*
U.S. Cl. 60—39.66 4 Claims

1. Gas turbine installation with a compressor and a gas turbine and having a rotor including rotary parts of the compressor and the gas turbine, the compressor having an air flow path therethrough external to the rotor, comprising a system for cooling the parts of the gas turbine including means defining two different air flow paths within the rotor, one of said cooling air flow paths within the rotor branching from the external air flow path at an intermediate stage of the compressor at which the absolute velocity of the air flow into the rotor is relatively low and extending to an axial region of the rotor, and the other of said cooling air flow paths within the rotor branching from the external air flow path at a location downstream from the compressor in flow direction of the external air flow at which the circumferential velocity of the air flow into the rotor is relatively high and extending into a radially

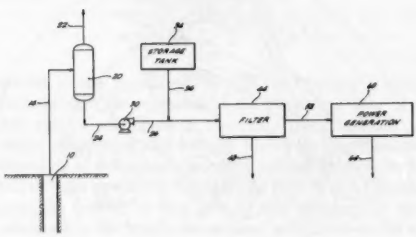


outwardly disposed region of the rotor, both of said cooling air flow paths extending mutually concentrically through a non-partitioned chamber in the rotor to the rotary parts of the gas turbine.

4,127,989
METHOD FOR SEPARATING METAL VALUES FROM BRINE

Grant A. Mickelson, Yorba Linda, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Jan. 25, 1978, Ser. No. 872,104
Int. Cl.[2] C01G *1/12*
U.S. Cl. 60—641 12 Claims



11. A process for separating and recovering metal values from a geothermal brine having at a temperature of about 500° F. or above and containing dissolved heavy metal ions and/or transition metal ions which comprises:

(a) pressuring said geothermal brine to a pressure of about 700 p.s.i.g., said pressure being in excess of the bubble point pressure of said geothermal brine;

(b) adding an aqueous solution of sodium sulfide and/or sodium polysulfide to said pressurized geothermal brine to form insoluble heavy and/or transition metal sulfide precipitates while maintaining said pressurized geothermal brine at a pressure in excess of its bubble point pressure;

(c) filtering said insoluble precipitates from said pressurized geothermal brine in a high pressure filter while maintaining said pressurized geothermal brine at a pressure in excess of its bubble point pressure.

(d) recovering metal values from said filtered insoluble heavy and/or transition metal sulfide precipitates; and

(e) deriving useful energy from said geothermal brine from which said insoluble precipitates have been filtered.

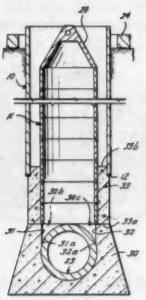
12. The process of claim 11 wherein said metal values are manganese, iron, copper, silver, lead and/or zinc.

4,127,990

DRAINAGE STRUCTURE FORMING METHOD

Otis L. Morrow, 727 Eastlake, Houston, Tex. 77034

Filed Jan. 21, 1977, Ser. No. 761,002
Int. Cl.[2] E02D *29/12*
U.S. Cl. 405—36 24 Claims



1. A method for forming a drainage structure, such as a manhole having a bottom portion and an upwardly extending wall portion for communication with a subterranean sewer pipe, comprising the steps of:

forming a first excavation in the earth from the surface to a subterranean sewer pipe;

positioning a removable outer form means in the excavation extending from the surface to the uppermost wall portion of the sewer pipe and fitting tightly with wall portions of the first excavation to prevent caving in thereof;

undercutting the sewer pipe by forming a second excavation in the soil surrounding the sewer pipe to a depth below the lowermost wall portion of the sewer pipe;

pouring concrete into the excavation surrounding the sewer pipe to a level adjacent the uppermost wall portion of the sewer pipe to form the bottom portion;

positioning a removable inner form means within the outer form means extending upwardly from the uppermost wall portion of the sewer pipe; and

pouring concrete in the space between the outer and inner form means for forming the upwardly extending wall portion to a predetermined height.

4,127,991

APPARATUS FOR LEVELING AND SUPPORTING A SUB-SEA DRILLING TEMPLATE

A. Michael Regan, Huntington Beach, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.

Filed Aug. 8, 1977, Ser. No. 822,697
Int. Cl.[2] E02D *21/00*
U.S. Cl. 405—202 11 Claims

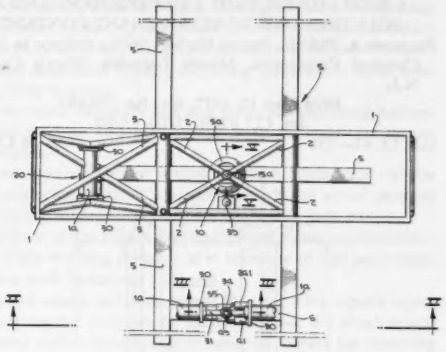
1. A remotely operable sub-sea drilling template and leveling support apparatus for sub-sea well drilling operations, comprising:

a sub-sea well drilling template;

support frame means for providing a stable reference surface for said template when positioned beneath the sea surface relative to an underlying sea bottom;

pivot means for interconnecting said support frame means and said template for pivotally supporting said template with respect to said sea bottom;

leveling means interconnected between said support frame means and said template for varying the angular orientation of said template beneath said sea surface about said pivot means relative to said support frame means; and



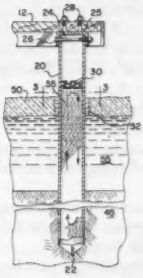
control means at a location remote from said levelling means and connected thereto for operating said leveling means to level said template beneath said sea surface.

4,127,992

PERMANENT PIER PILING

Donald Bogosh, 2646 Willow St., Franklin Park, Ill. 60131

Filed Jun. 13, 1977, Ser. No. 806,157
Int. Cl.[2] 405 *218;* E02B *17/00;* E02D *31/00*
U.S. Cl. 405—61 5 Claims



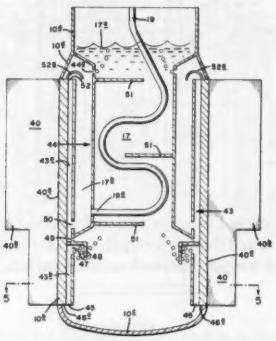
1. A hollow piling which is permanently embedded in a bed beneath a body of water, which water may have a fluctuating level, the piling having a construction for preventing ice from forming on the piling and forcing the piling upwardly when the water level changes comprising, in combination, a hollow pipe having outer walls and a lower end portion which is fluid-tightly sealed, a substantial length of the piling being embedded in the bed of the body of water, an antifreeze liquid within said pipe, said antifreeze liquid having an upper surface level above the high water level of the body of water, said piling and said antifreeze liquid extending into the bed a sufficient depth to transfer latent heat from the bed to said antifreeze liquid through said outer walls of said piling to develop a natural thermal convection current of said antifreeze liquid within said pipe and cycle said latent heat from the bed upwardly within said pipe, said natural thermal convection being the sole source of movement of said antifreeze liquid within said piling, said natural cycling being effective to retain the temperature of said antifreeze liquid above the freezing point of said body of water whereby said outer walls are heated by the cycling liquid sufficiently to prevent ice from forming around the walls of said piling at any level below the level of said antifreeze.

4,127,993

METHOD AND GENERATOR UNIT OF AN ABSORPTION HEAT PUMP SYSTEM FOR SEPARATING A RICH LIQUOR INTO A REFRIGERANT AND A SOLUTION LOW IN REFRIGERANT CONTENT

Benjamin A. Phillips, Benton Harbor, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed May 12, 1977, Ser. No. 796,493
Int. Cl.[2] F25B *15/00, 33/00*
U.S. Cl. 62—101 **36 Claims**



1. A generator unit of an absorption heat pump system for separating rich liquor into refrigerant vapor and weak liquor, and including a boiler portion at the lower portion thereof and comprising:

(a) an upstanding housing defining therewithin a central space with a reservoir zone in the lower portion thereof for storing the rich liquor solution and also defining a plurality of vertical tubular conduits around.the reservoir zone, each tubular conduit having a lower opening communicating with the reservoir zone for drawing solution therefrom and an upper opening for releasing refrigerant vapor and weak liquor;

(b) heat transfer means for collecting heat from an external source and transferring the heat into said tubular conduits; and

(c) separation means communicating with the upper openings of said tubular conduits for separating refrigerant vapor from weak liquor.

22. A method of separating a rich liquor comprising a refrigerant and a higher-boiling absorbent into refrigerant vapor and a solution low in refrigerant content comprising the steps:

(a) drawing the rich liquor into a lower inlet of a vertical tubular conduit at a temperature at which bubbles of refrigerant vapor are forming in the rich liquor,

(b) heating the rich liquor in the conduit thereby increasing the formation of bubbles of refrigerant vapor,

(c) driving the rich liquor upward in the vertical tubular conduit with increasing speed by the vapor lift action of refrigerant bubbles to an upper outlet of the vertical tubular conduit, and

(d) separating the fluid coming out of the upper outlet of the vertical tubular conduit into refrigerant vapor and a solution low in refrigerant content.

4,127,994

OIL STIRRER FOR REFRIGERATION COMPRESSOR

Ralph E. Niven, Grove City, Ohio, assignor to White-Westinghouse Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1977, Ser. No. 762,829
Int. Cl.[2] F25B *43/02;* **B04B** *17/00, 35/00;* **F04B** *17/00*
U.S. Cl. 62—469 **7 Claims**

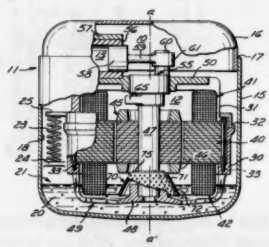
1. A refrigeration apparatus comprising:

a shell containing a gas;

a motor compressor assembly mounted within said shell, said motor-compressor assembly having a rotatable shaft with a longitudinal axis of rotation;

a body of oil contained within said shell; and

an oil stirrer for aerating said body of oil with said gas, said stirrer being fixed to said shaft, said oil stirrer having a



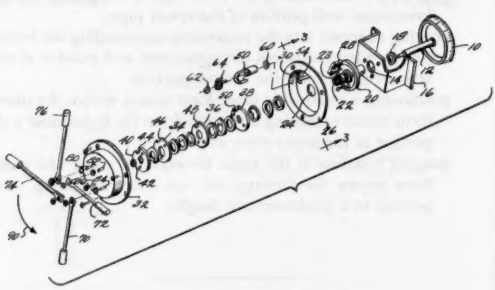
portion formed of thin sheet material having a large plurality of closely spaced apertures said material being shaped into an open-ended truncated cone with an apex portion and a base portion, said apex portion being fixed to said shaft and being above said body of oil, said base portion extending into and immersed in said body of oil.

4,127,995

MULTIPLE BOLT COMBINATION LOCK

Norman Miller, Lafayette, Ind., assignor to Schwab Safe Co., Inc., Lafayette, Ind.

Filed Apr. 15, 1977, Ser. No. 787,934
Int. Cl.[2] E05B *37/08, 63/14*
U.S. Cl. 70—119 **3 Claims**



1. A multiple bolt combination lock comprising:

a combination dial having a shaft rotatable therewith;

a plurality of locking wheels disposed about said shaft, each having a slot gate, the gate of each wheel aligning in a given position when the dial is rotated to the correct combination;

a bottom lock pan having an aperture through which said shaft extends;

a top lock pan fastened to said bottom lock pan to define a space therebetween in which said wheels are disposed;

a lever arm;

means for mounting said lever arm on said bottom lock pan in said space so that said lever arm pivots to engage said slot gates when said wheels are aligned at said given position and so that said lock pans then rotate with said shaft;

spring means for urging said lever arm into engagement with said slot gates;

a plurality of locking rods pivotably fastened to one of said lock pans at a distance from the center of rotation thereof so that rotation of said one lock pan in one direction retracts said rods and rotation of said one lock pan in the opposite direction advances the rods into a latch position;

a lock stand having an aperture through which said shafts extends; and

a wheel post having a bore and fixed to said lock stand with said bore and aperture in alignment, said post including a cam portion extending through a slot in said top pan to engage said lever arm to rotate said lever arm out of said slot gates when said one pan is rotated in said opposite direction and said rods are in said latch position.

4,127,996

KEY PROFILE SYSTEM

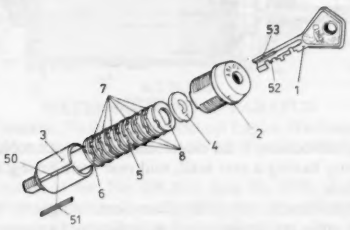
Henrikki Malminen, and Kaarlo Martikainen, both of Joensuu, Finland, assignors to Oy Wartsila AB, Helsinki, Finland

Filed Sep. 28, 1977, Ser. No. 837,641

Claims priority, application Finland, Oct. 4, 1976, 762819

Int. Cl.[2] E05B *19/02, 27/08*

U.S. Cl. 70—365 **8 Claims**



1. A locking system comprising several disc cylinder locks provided with turnable locking discs and several keys having different key profiles, said key profiles being of a form includable within the border line of a basic key blank profile and having at least one key profile adapted to fit functionally into a lock adapted to receive keys of another profile, said key profile being defined by a form of a key receiving opening in said turnable locking disc and having common elements of said cylinder locks respectively similar to each other.

4,127,997

ROLLING MILL STAND

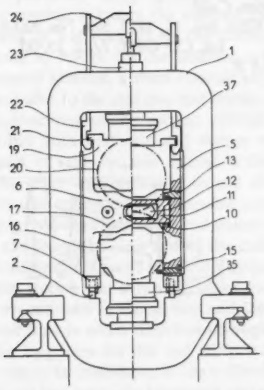
Andre Quehen, Pontoise, France, assignor to SECIM, Courbevoie, France

Filed Dec. 12, 1977, Ser. No. 859,508

Claims priority, application France, Dec. 17, 1976, 76 38143

Int. Cl.[2] B21B *37/08, 1/10*

U.S. Cl. 72—19 **6 Claims**



1. A stand of a continuous rolling mill for producing beams and similar sections including two horizontal and two vertical rolls, the stand being centered on the pass line of the beam to be rolled and having fixed roll housings in the rolling line for receiving a removable cassette for supporting said rolls and their chocks for each said rolls, the improvement comprising:

hydraulic tightening jack means for a different chock of each horizontal roll, a said jack means located between a chock and associated housing and being supportable by an associated housing,

servo-valve means for said jack means for supplying hydraulic fluid to said jack means from an hydraulic power means,

linear position sensor means for each horizontal roll for producing a signal representative of the actual position during rolling of at least one associated jack means,

pressure sensor means for producing a signal representative of the working pressure of at least one of said jack means for each horizontal roll, and

control means including means for producing signals representing the modulus for each portion of the stand associated with a different horizontal roll, means for receiving said pressure sensor signals and combining them with the modulus signal for the same stand portion to produce position reference signals for each horizontal roll, means for receiving said linear position signals, and means for comparing said corresponding position reference signals with said corresponding signals representing the actual positions of corresponding jack means for said horizontal rolls to generate command signals for operating said servo-valve means for said jack means for each roll for maintaining a constant web thickness and a symmetrical web position relative to a flange portion of the beam.

4,127,998

MANDREL CHANGING DEVICE FOR A PIERCING ROLLING MILL

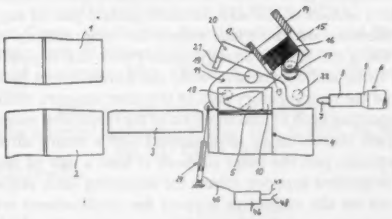
Hans Meurer, and Klaus Rehag, both of Mönchen-Gladbach, Fed. Rep. of Germany, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Dec. 6, 1977, Ser. No. 858,047

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2657059

Int. Cl.[2] B21B *25/06*

U.S. Cl. 72—97 **8 Claims**



1. In combination with a piercing rolling mill or the like and a mandrel changing device, which has at least two mandrel supporting members which can be alternately positioned in the rolling line of the mill in order to transfer mandrels to and from the rolling line, and wherein a mandrel rod carries at its front end a pin on which a mandrel is mounted in a manner to be quickly replaced by another,

a mandrel stripper device comprising:

first means for restricting a mandrel from moving in one direction coaxially with the rolling line when supported by one of said supporting members positioned in said rolling line,

second means for restricting a mandrel from moving in an axial direction opposite said first direction when supported by said one supporting member,

a first lever for supporting said first restricting means,

means for causing movement of said first lever so as to bring

said first restricting means into and out of its operative position,

a second lever for supporting said second restricting means, and

means for causing movement of said second lever so as to bring said second restricting means into and out of its operative position,

whereby when said restricting means are in their operative mandrel restricting positions said supported mandrel will be stripped from said mandrel rod and maintained in a predetermined position on said rolling line, and when said restricting means are in their inoperative non-mandrel restricting positions a mandrel, mandrel rod and tube blank are free to move in said rolling line.

4,127,999

GRIPPING ARRANGEMENT

Horst Lorenz, Solingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

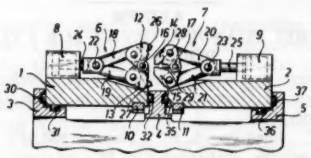
Continuation-in-part of Ser. No. 641,188, Dec. 16, 1975, Pat. No. 4,048,833. This application Jun. 24, 1977, Ser. No. 809,937

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1974, 2460168

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.[2] B21C *1/14, 1/28*

U.S. Cl. 72—290 **11 Claims**



1. A gripping arrangement for continuously advancing elongated workpieces longitudinally thereof in an advancement path, comprising, in combination, elongated guide means parallel to a section of the advancement path; a pair of supports each mounted on said guide means for reciprocatory movement along the same in a reciprocatory path that is parallel to, offset from, and coextensive with, the advancement path section and the reciprocatory path of the other support; means for reciprocating each of said supports in the respective reciprocatory path thereof in an advancement and a return direction, respectively, past the other support; at least a pair of jaws for each respective support; means for mounting each respective jaw pair on the respective support for displacement relative thereto between a closed and an open position in which said respective jaw pair engages, and is disengaged from, a workpiece, respectively, and for joint reciprocation with said respective support, when in said closed position, in a first path having a path portion about the advancement path section in common with the first path of the other jaw pair, and, when in said open position, in a second path spaced from the advancement path section and from said common path portion; and means for so displacing said jaws of each respective pair between said positions thereof that at least one of said jaw pairs is always in said closed position thereof while moving with the respective support in said advancement direction for engaging and continuously advancing the workpiece, while each of said jaw pairs is in said open position thereof at least while moving with the respective support in said return direction past the other jaw pair for avoiding interference with the movement of the latter by moving in said second path that is outside said common path portion.

4,128,000

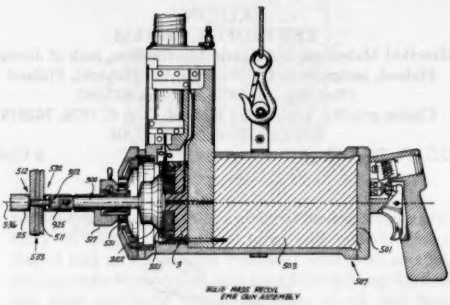
ELECTROMAGNETIC HIGH ENERGY IMPACT APPARATUS

Franciscus Hogenhout, Bellevue, and Arthur W. McDermott, Maple Valley, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1977, Ser. No. 837,486

Int. Cl.[2] B21J *7/30, 15/24*

U.S. Cl. 72—430 **1 Claim**



1. In combination, in an electromagnetic work tool;

a housing having a rear wall, said rear wall having an inner surface;

the improvement comprising: an electromagnetic high energy pulse coil having a working face and a major surface opposite said working face;

a ram assembly comprising a ram shaft, conductive driving plate, driving disc, insulator plug, and including a plurality of longitudinally disposed machine screws for securing said driving disc, insulator plug and ram shaft together, and further including a plurality of roll pins for securing said conductive driving plate and driving disk together; and

a recoil assembly comprising a solid mass disposed between said major surface of said electromagnetic high energy pulse coil and said rear wall of the inner surface of said housing, said solid mass having the front wall surface thereof disposed perpendicular to the centerline of said ram assembly.

4,128,001

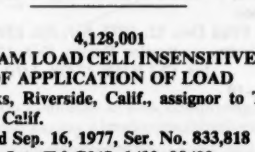
PARALLEL BEAM LOAD CELL INSENSITIVE TO POINT OF APPLICATION OF LOAD

Eugene A. Marks, Riverside, Calif., assignor to Transducers, Inc., Whittier, Calif.

Filed Sep. 16, 1977, Ser. No. 833,818

Int. Cl.[2] G01L *1/22, 25/00*

U.S. Cl. 73—1 B **37 Claims**



32. A method of reducing the sensivity to moments created by misalignments of applied loads with the support in a parallel beam load cell of the type having a pair of spaced parallel beams rigidly connected at their respective ends and a plurality

of strain responsive means responsive to strain at selected regions of said beams which comprises the steps of:

(a) determining the change in output of said load cell with respect to a change in position of application of load in a direction parallel to the longitudinal axes of said beams;

(b) determining the change in output of said load cell with respect to the change in position of application of load in a direction transverse to the longitudinal axes of said beams;

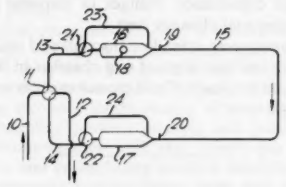
(c) shifting the location of the neutral axis of one of said beams at one of said selected regions whereby the change in load cell output due to a transverse change in position of load will be reduced; and

(d) altering the cross sectional area of one of said beams at one of said selected regions whereby the change in load cell output due to a longitudinal change in position of load will be reduced.

4,128,002
METER PROVING APPARATUS

Ian F. Cameron, Newark, and Michael Layhe, Worksop, both of England, assignors to Automatic Oil Tools Limited, Hounslow, England

Continuation of Ser. No. 608,888, Aug. 29, 1975, abandoned.
This application Apr. 25, 1977, Ser. No. 790,576
Claims priority, application United Kingdom, Jun. 16, 1975, 25607/75
Int. Cl.² G01F *25/00*
U.S. Cl. 73—3 **8 Claims**

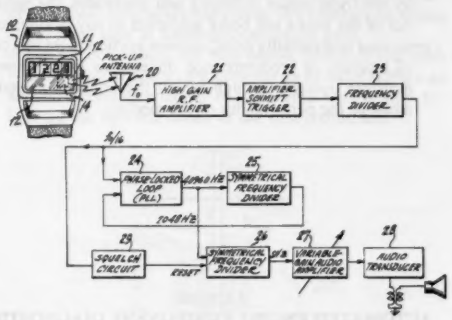


1. A proving apparatus for a flow meter comprising a calibration conduit for receiving a fluid, a plug locatable in the conduit to be carried along the conduit by fluid flow, two end stations at the ends of the conduit for accommodating the plug prior to a test operation, two plug detector devices spaced apart along the conduit between the ends of the stations to signal the passing of the plug along the conduit, a second conduit connected to one of the end stations, a first diverter valve in said second conduit, a third conduit extending from the first diverter valve to the said one end station at a location between the connections of the second concuit and of the calibration conduit with said one end station to provide a by-pass for a part of said one end station, a fourth conduit connected to the other end station, a second diverter valve located in the fourth conduit, a fifth conduit extending from the second diverter valve to said other end station between the connections of the fourth conduit and of the calibration conduit with said other end station to provide a by-pass for a part of said other end station and a further valve for connecting supply and return conduits to the second and fourth conduits to establish a fluid flow in either direction through the calibration conduit, the by-passes for the end stations permitting a stabilized flow rate to be established in the calibration conduit, with said plug being located in the by-passed part of one of said end stations, prior to a test operation so that during a test, the fluid flow rate moving said plug through said conduit is substantially constant.

4,128,003
ACOUSTIC COUPLERS FOR HOROLOGICAL CALIBRATION INSTRUMENTS

Louis A. Zanoni, Trenton, and James W. Pollack, New Egypt, both of N.J., assignors to Zantech, Inc., Trenton, N.J.

Filed Jan. 21, 1977, Ser. No. 761,261
Int. Cl.² G04C *21/00*
U.S. Cl. 73—6 **10 Claims**



1. Apparatus for converting a radiated high frequency output signal from a reference oscillator employed in an electronic timepiece to an audible signal corresponding to the ticking rate of a conventional mechanical timepiece, comprising:

(a) pickup means responsive to said radiated signal to provide at an output, an amplified version of said high frequency radiated signal,

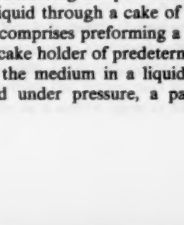
(b) means coupled to said pickup means and responsive to said amplified signal to provide at an output a low frequency signal synchronized to said radiated signal and of a repetition rate relatively equal to the rate of ticks per second of a mechanical timepiece, and

(c) audio transducing means responsive to said low frequency signal to provide an audible output signal manifesting the ticking of a mechanical timepiece.

4,128,004
METHOD AND APPARATUS FOR DETERMINING PERMEABILITY OF FILTER MEDIA

Jacques Caron, Courbevoie; Jean-Claude Poncet, and Bernard Varney, both of Villers Cotterets, all of France, assignors to Société Anonyme dite: CECA S.A., Velizy-Villacoublay, France

Filed Sep. 22, 1978, Ser. No. 835,701
Claims priority, application France, Oct. 8, 1976, 76 30351
Int. Cl.² G01N *15/08*
U.S. Cl. 73—38 **7 Claims**



1. In a method of measuring the permeability of a filtering medium by passing liquid through a cake of the medium, the improvement which comprises preforming a cake by:

introducing into a cake holder of predetermined dimensions a suspension of the medium in a liquid, the suspension being introduced under pressure, a pair of electrodes

being located above a predetermined level of the medium in the cake holder;

terminating said introduction of the suspension when a portion of the medium above said predetermined level at least partially engulfs said electrodes while continuing to apply said pressure;

Interrupting said pressure when said portion of medium attains a predetermined degree of dehydration as sensed by electrical means including said electrodes, the remainder of the media not being subjected to any drying; and

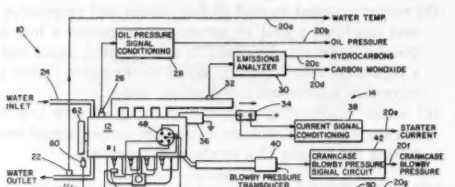
removing said partially dried medium portion to leave a cake of medium of predetermined dimensions and maximum moisture content through which the liquid is passed to measure the permeability of the medium.

4,128,005

AUTOMATED ENGINE COMPONENT DIAGNOSTIC TECHNIQUES

Robert W. Arnston, Schaumburg; Gerald C. Trussell, Park Ridge, both of Ill., and Leo G. Rich, Rochester, Mich., assignors to Sun Electric Corporation, Chicago, Ill.

Filed Jun. 16, 1977, Ser. No. 807,186
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—117.3 **12 Claims**



1. An apparatus for diagnosing an internal combustion engine including a plurality of engine components and a plurality of engine operating parameters, said engine having engine specifications for said engine operating parameters, comprising in combination:

input means for providing input signals representative of said engine operating parameters;

memory means for storing said engine specifications in the form of discrete coded data specifying a problem level associated with one or more of the operating parameters;

processor means for:

(i) respectively comparing said input signals and said engine specifications;

(ii) generating a plurality of diagnostic signals, each of said diagnostic signals representing the correlation between a said engine operating parameter and a said engine specification;

(iii) selectively analyzing at least one of said diagnostic signals; and

(iv) generating an instructional signal indicating an operating state of at least one of said engine components; and

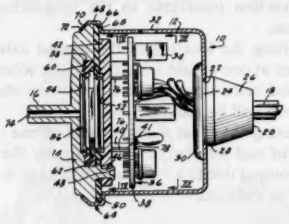
display means for visually displaying said instructional signal.

4,128,006

PACKAGING OF PRESSURE SENSOR CELLS

Ronald D. Grabow, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Dec. 13, 1976, Ser. No. 749,809
Int. Cl.[2] G01L *9/12*
U.S. Cl. 73—724 **26 Claims**



1. Pressure transducer apparatus comprising:

a pressure capsule including a pair of capacitances which are variable in response to pressure;

chamber forming means defining a sealed chamber including a port for connection in fluid communication with a pressure to be detected, said capsule mounted in and dividing said chamber into two parts, said port opening into one of said chamber parts;

an electric circuit connected to said capacitances and responsive to the capacitance thereof to produce an output signal indicative of the detected pressure;

resilient means mounting said capsule in said chamber to prevent capacitance changes in response to deliterious environmental changes; and

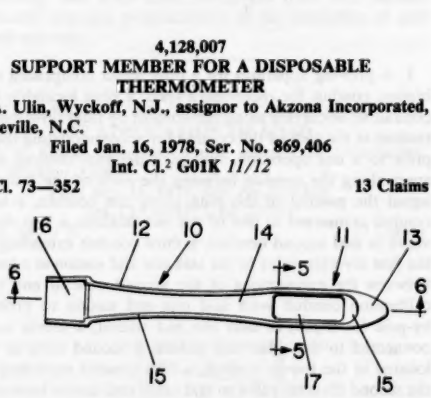
a fluid passageway extending through said resilient means to connect said two parts of said chamber in fluid communication so that each of said capacitances is subjected to the same pressure.

4,128,007

SUPPORT MEMBER FOR A DISPOSABLE THERMOMETER

Roy A. Ulin, Wyckoff, N.J., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jan. 16, 1978, Ser. No. 869,406
Int. Cl.[2] G01K *11/12*
U.S. Cl. 73—352 **13 Claims**



1. An adapter for use with an attachment to a disposable thermometer comprising:

an elongated substantially rigid member;

said member having a forward section and a rearward section;

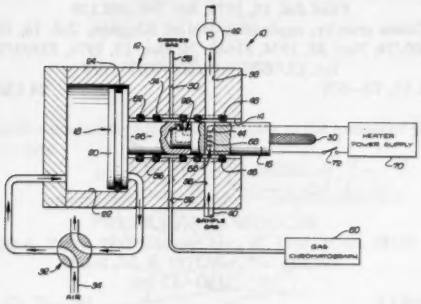
said member further having means to retain a disposable thermometer thereto;

said forward section having an opening therethrough for providing improved thermal conductivity to the thermometer.

4,128,008
CONCENTRATION VALVE FOR A GAS DETECTING APPARATUS, OR THE LIKE

Amos Linenberg, North Hollywood, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Filed May 4, 1977, Ser. No. 793,608
Int. Cl.[2] G01N *1/22*
U.S. Cl. 73—422 GC **3 Claims**



1. In a concentration valve for a gas detecting apparatus, or the like, the combination of:

(a) a cylinder having circumferentially spaced, diametrically opposed inlet and outlet ports for a sample gas, and having circumferentially spaced, diametrically opposed inlet and outlet ports for a carrier gas longitudinally spaced from and in the same longitudinal plane as the sample-gas inlet and outlet ports;

(b) a cylindrical plug provided with a diametrical passage therethrough having ends respectively adapted to communicate with said sample-gas inlet and outlet ports, or with the carrier-gas inlet and outlet ports, said cylindrical plug being movable longitudinally of said cylinder between a sampling position wherein said passage therethrough communicates with said sample-gas inlet and outlet ports and an analyzing position wherein said passage therethrough communicates with said carrier-gas inlet and outlet ports;

(c) adsorbing means in said passage through said cylindrical plug and operable to adsorb in said sampling position;

(d) means for heating said adsorbing means in said analyzing position;

(e) actuating means for longitudinally moving said cylindrical plug between said sampling and analyzing positions, said actuating means comprising a second cylinder coaxial with the cylinder first mentioned, a piston in said second cylinder, means for securing said cylindrical plug to said piston, and valve means for selectively directing air under pressure to opposite ends of said piston; and

(f) said means for securing said cylindrical plug to said piston comprising a readily releasable connecting means.

4,128,009
ADJUSTABLE DILUTING DEVICE

Eric Marteau D'Autry, 69-72 rue Gambetta, 95 Villiers-le-Bel, France

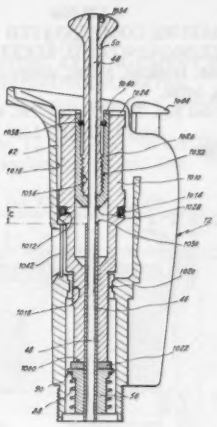
Filed Aug. 11, 1977, Ser. No. 823,552
Claims priority, application France, Aug. 18, 1976, 76 25081
Int. Cl.[2] B01L *3/02*
U.S. Cl. 73—425.6 **14 Claims**

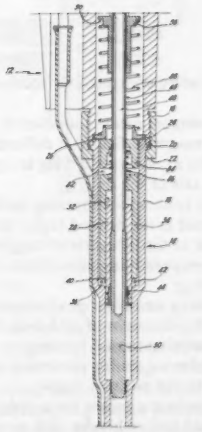
1. An adjustable diluting device intended for mixing a predetermined volume of a liquid sample and a predetermined volume of a liquid diluent, of the type comprising an oblong casing, internally defining an essentially cylindrical cavity, and a lower tapered tubular element, or nose member, said casing and said nose member being made fast with each other, and comprising a plunger unit adapted for reciprocal movement in tight manner inside said casing and said nose member, said plunger unit itself comprising:

a first piston having a central cylindrical recess opening on its lower surface, this first piston being so arranged as to slide in tight manner inside said nose member,

a second cylindrical piston of circular cross-section adapted to slide in said central cylindrical recess made in the first piston, with the interposition, between said central cylindrical recess and the second piston, of a sealing ring acting at the same time as frictionally mounted joint;

a sleeve for controlling the first piston, which is fast with said first piston, and which presents on its outer surface an annular shoulder adapted to cooperate with a stop for limiting the upward stroke of the first piston, and





a shaft for controlling the second piston, which is fast with said second piston and which is adapted to slide inside the sleeve for controlling the first piston,

said diluting device further comprising:

a member for regulating the stroke of the first piston, said regulating member being housed in said cavity of the casing, coaxially with respect to said cavity, and having on at least a part of its outer surface a thread adapted to cooperate with a corresponding thread made on the inner surface of said cavity, the lower end of said regulating member acting as stop for limiting the upward stroke of the first piston, whilst the upper part of said regulating member terminates in a sleeve open at its upper end;

a tubular adjusting member adapted to move freely inside the upper part of the regulating member, the lower end of which has a stop surface adapted to cooperate with the free upper end of the sleeve for controlling the first piston and of which at least a part of the inner surface is threaded, and,

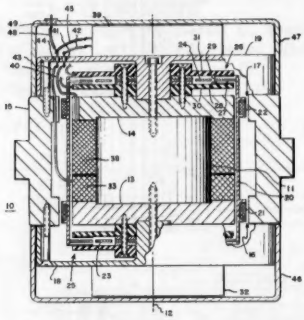
a tubular push element made fast with the shaft for controlling the second piston, the lower end of which is provided with an outer thread adapted to cooperate with said inner thread made on the inner surface of the tubular adjusting member, a frictionally mounted joint being interposed between said tubular push element and the inner surface of the tubular adjusting member.

4,128,010

TEMPERATURE COMPENSATED PERMANENT MAGNET/MOVING COIL ACCELEROMETER

Vernon H. Aske, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 21, 1977, Ser. No. 835,272
Int. Cl.[2] G01P *15/08*
U.S. Cl. 73—497 **10 Claims**



1. A temperature compensated accelerometer comprising:

a housing;

permanent magnet means mounted in said housing for producing a magnetic field in a defined region;

a mass having a coil thereon lying in a plane perpendicular to a central axis of the coil;

a suspension system for mounting said mass so that said coil is positioned in the defined region with the axis of the coil transverse to the direction of magnetic field, said suspension system permitting movement of said mass relative to said housing;

position sensing means for producing a position signal indicative of displacement of said mass from a predetermined position relative to said housing;

servo amplifier means for producing a rebalance current in response to the position signal;

electrical conductor means for supplying the rebalance current to said coil, whereby said mass is maintained in the predetermined position;

a temperature sensing winding for producing a temperature signal indicative of the temperature of said permanent magnet means;

an auxillary winding associated with said permanent magnet means for augmenting the magnetic field produced in the defined region;

a differential amplifier having inverting and noninverting input terminals and an output terminal;

means for connecting said auxillary and temperature sensing windings in series in a negative feedback circuit between the output and inverting input terminals of said differential amplifier; and

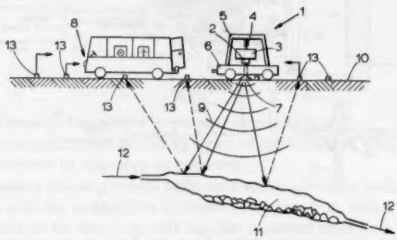
biasing means for supplying biasing voltages to the inverting and noninverting input terminals of said differential amplifier.

4,128,011

INVESTIGATION OF THE SOUNDNESS OF STRUCTURES

Robert J. Savage, Ulverley House, Woodland Way, Kingswood, Surrey, England

Filed Jul. 15, 1975, Ser. No. 596,120
Claims priority, application United Kingdom, Jul. 16, 1974, 31500/74; Nov. 28, 1974, 51660/74; Dec. 12, 1974, 53803/74
Int. Cl.[2] G01N *29/00*; G01V *1/14*
U.S. Cl. 73—579 **24 Claims**



1. A method of locating and determining the extent of any near surface structural void, shear plane, fault, inclusion zone, weakness or anomaly within a structure said method comprising the steps of:

transmitting a vibration wave of momentary fixed frequency over a large frequency range into and through said structure from a specific vibration input location and thereby producing vibration responses at various points in said structure;

detecting the vibration responses at a plurality of detection locations spaced from said vibration input location over at least a substantial two dimensional structure area;

determining the first frequency vibration responses at said detection locations; and

plot connecting the detection location points of maxima or resonance frequency to indicate the presence and to define by contour outline the location, size and nature of a void, shear plane, fault, inclusion, zone of weakness, or anomaly within said structure.

4,128,012

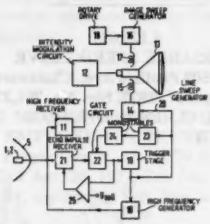
ULTRASONIC EXAMINATION APPARATUS OPERATING ACCORDING TO THE IMPULSE-ECHO METHOD

Richard Soldner, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 27, 1977, Ser. No. 846,161
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2651001
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—611 **7 Claims**

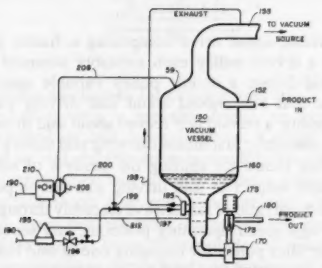
1. Ultrasonic examination apparatus operating according to the impulse-echo method, particularly intended for medical purposes, comprising an ultrasonic transmitting/receiving system for radiating ultrasonic impulses into a subject to be examined, and having a precursor path through which the ultrasonic impulses are transmitted, an echo impulse imaging device, operated in dependence upon the transmit impulses, for forming an image of the echo impulses of each transmit pulse arriving at the receiver in chronological succession corresponding to the time sequence of their occurrence, characterized by an additional installation with a time measuring means (21 through 25) for determining the precursor time (T_v) of each

transmit impulse through the precursor path (6), and an adjustment means (19) for adjusting the impulse sequence time (T_s) of



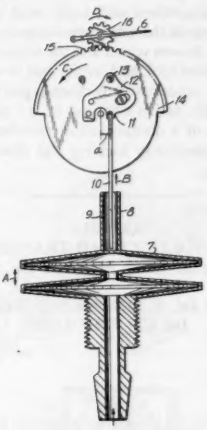
respective consecutive transmit impulses to the measured precursor time.

4,128,013
PRESSURE TRANSDUCER
Joseph A. Perry, 1815 Eleanor Ave., St. Paul, Minn. 55116
Filed Jul. 8, 1977, Ser. No. 813,932
Int. Cl.[2] G01L *7/08*
U.S. Cl. 73—701 **8 Claims**



1. A pressure transducer adapted to be mounted in the wall of a container having an opening therein for sensing pressure within the container, comprising, a mounting member for said transducer having a body portion adapted to be sealed to said container over the opening therein, said mounting member having an inner flange at one end thereof adjacent the container with an opening therein communicating with the opening in the container, an outer flange upon said mounting member at the other end thereof for mounting said transducer within said mounting member, said mounting member having a bore therethrough between said inner and outer flanges, a flat pressure sensitive diaphragm positioned in the mounting member, sealing members positioned on both sides of said diaphragm around the edges thereof, a transducer body positioned within the bore of the mounting member, means clamping said transducer body within said mounting member with said diaphragm positioned between said inner flange of said mounting member and an inner end of said transducer and with said sealing members sealing said diaphragm to said mounting member and said end of said transducer body to permit movement of the diaphragm toward and away from said transducer body and with said diaphragm exposed to the opening in said container, said diaphragm forming a pressure chamber with the end of said transducer body, an exhaust passage means positioned centrally through said transducer body communicating with said pressure chamber, an exhaust nozzle mounted in the said exhaust passage and adapted to be adjustably positioned axially therein relative to said diaphragm, additional passage means through said transducer body communicating with said pressure chamber adapted to be connected to a fluid pressure source for establishing a pressure within said chamber which is controlled by the position of said diaphragm relative to said exhaust passage nozzle and is equal to the fluid pressure within said container, said exhaust passage means being a tapped aperture through the transducer body with the exhaust nozzle having a threaded exterior surface and a centrally located aperture therein such that the exhaust nozzle may be threaded into the exhaust passage, means in the end of the exhaust nozzle remote from the diaphragm for adjusting the position of the exhaust nozzle axially in the exhaust passage, and means connected to exhaust passage means to remove exhaust air to a subatmospheric destination.

4,128,014
FINE-ADJUSTING ARRANGEMENT FOR A SPHYGMOMANOMETER
Shachio Enatsu, Tokyo, Japan, assignor to Bristoline Inc., Island Park, N.Y.
Filed Dec. 12, 1977, Ser. No. 859,746
Claims priority, application Japan, Dec. 14, 1976, 51-167682[U]
Int. Cl.[2] G01L *7/06*
U.S. Cl. 73—729 **12 Claims**



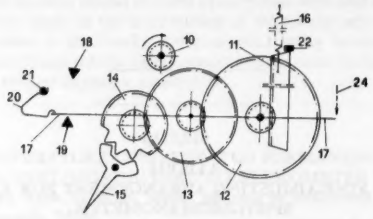
1. In an apparatus for measuring pressure, particularly a sphygmomanometer, a combination comprising:
(a) a movable indicator;
(b) actuating means movable in response to changes in air pressure generated in the apparatus;
(c) coupling means operatively connected to said actuating means and said indicator for moving the latter along a path between a floating starting position and an end measuring position, said coupling means including a pair of coupling members spaced from each other at a spacing which determines the position of said indicator along the path; and
(d) fine-adjusting means for shifting said coupling members relative to each other to thereby vary said spacing and for setting said indicator with fine continuous adjustment to said starting position, including
an elongated adjustment member having a threaded shaft portion, and
a support mounted on one of said coupling members and having a passage in which said shaft portion is mounted in threaded engagement therewith for infinite variable displacement relative to the other of said coupling members.

4,128,015

DEVICE FOR THE STORAGE OF POWER AND ITS CONTROLLABLE, SLOW RATE RELEASE

Rodolfo Cicatelli, Lugano, Switzerland, assignor to Autovox, S.p.A., Rome, Italy

Filed Feb. 2, 1977, Ser. No. 765,024
Claims priority, application Italy, Feb. 2, 1976, 47899 A/76
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—89.17 **10 Claims**



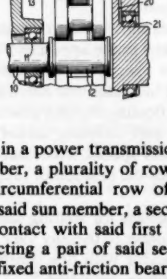
1. A device for the storage of power and its controllable, slow rate release, comprising: a storage member coupled to a drive member; a wheelwork alternatively operated by a motor and by the storage member; a lever fulcrumed to at least one wheel of the wheelwork and oscillating between two fixed positions; and an escapement means selectively coupled to said wheelwork; wherein, when said lever is in one of said fixed positions, the wheels of the wheelwork are in meshing engagement with a motor driven wheel and the storage member stores the power transmitted to it, and, when said lever is in said other fixed position, the wheelwork is disengaged from said motor and cooperates with and is coupled to, by movement of said level, one portion of a doubie-action member of said escapement means for selectively locking and slowly releasing the storage member.

4,128,016

HYBRID ROLLER GEAR TRANSMISSION

Algirdas L. Nasvytis, 10823 Magnolia Dr., Cleveland, Ohio 44106

Filed Jul. 6, 1976, Ser. No. 702,434
Int. Cl.[2] F16H *13/02*
U.S. Cl. 74—206 **7 Claims**



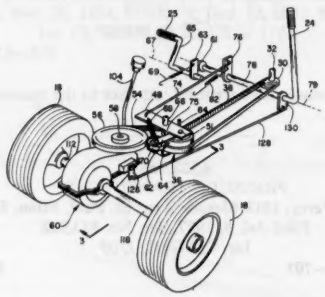
1. In combination in a power transmission device, a friction roller sun gear member, a plurality of rows of friction rollers including, a first circumferential row of friction rollers in driven contact with said sun member, a second row of circumferential rollers in contact with said first row, each roller of said first row contacting a pair of said second row rollers, a pair of peripherally fixed anti-friction bearing means rotatably supporting each roller of the outermost row, and axially spaced on opposite sides of each such roller, annular free-floating preload distributing ring means encircling and contacting the outermost row of said friction rollers, and drive output positive pinion gear means carried by each of said outermost row rollers between said bearing means and in positive drive connection with an annular output gear, the contact between said friction rollers comprising solely friction contact and the positive pinion gear drive output means comprising solely toothed contact.

4,128,017

VARIABLE SPEED DRIVE

George C. Clarke, 10509 Penfield Ave., Chatsworth, Calif. 91311

Filed Apr. 27, 1977, Ser. No. 791,373
Int. Cl.[2] F16H *55/52, 7/10*
U.S. Cl. 74—230.17 D **33 Claims**



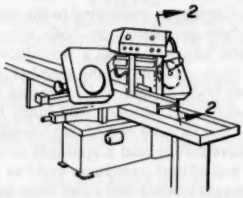
1. A variable speed drive comprising a frame; a driving pulley and a driven pulley each rotatably mounted with respect to said frame; a double pulley variable speed sheave assembly; a first belt reeved about said driving pulley and sheave assembly; a second belt reeved about said driven pulley and sheave assembly; first means carrying said sheave assembly and including means for shifting the position of said sheave assembly with respect to said driving and driven pulleys for altering the drive ratio of said sheave assembly through a range of low to high speed operating positions; and second means including an idler pulley for engaging one of said belts, means for movably mounting said idler pulley to said first means, and means for yieldably urging said idler pulley into engagement with said one of said belts.

4,128,018

DRIVE WHEEL

Andy Muntean, 20827 Sparta La., Olympia Fields, Ill. 60461

Filed Sep. 28, 1977, Ser. No. 837,081
Int. Cl.[2] F16H *1/06, 55/12*
U.S. Cl. 74—413 **4 Claims**



1. A drive wheel assembly for a machine tool of the band saw type comprising:

a rim section comprising a circular ring having a generally flat radially outer surface adapted to engage and drive an endless saw band or the like;

said rim section being provided with a plurality of circumferentially spaced, radially inwardly extending gear teeth on its radially inner surface, said teeth being adapted to engage and be driven by a rotatable driven pinion gear;

a hub section comprising a generally flat plate provided with

a centrally located hub section adapted to permit rotation of said plate about an axis perpendicular to said plate; and mechanical attaching means for attaching said hub section to said rim section with said axis collinear with the axis of said rim section.

4,128,019

STIRRING MECHANISM FOR A CLEARING VAT EMPLOYED IN BREWERIES

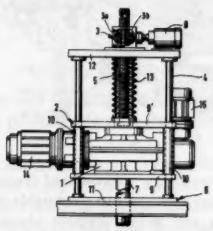
Dieter Kupka, Binger Landst. 37a, 6570 Kirn, Nahe, Germany

Filed Apr. 26, 1977, Ser. No. 790,894

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 7616495[U]

Int. Cl.² F16H *27/02, 1/18*

U.S. Cl. 74—424.8 R **10 Claims**



1. A stirring mechanism for clearing vats which are used in breweries, comprising a movable frame, an electric drive motor mounted on said movable frame, a worm gear drive connected to said electric drive motor for operation thereby and being mounted on said movable frame, a stirrer shaft connected to said worm gear and being rotatable thereby and depending from and rotatably supported on said movable frame, a fixed support frame having guide rod means for guiding said movable frame for upward and downward movement, an intermediate member secured to said movable frame and guided on said fixed support frame, and an elevating motor mounted on said fixed support frame and connected to said intermediate member to drive said intermediate member and said frame upwardly and downwardly.

4,128,020

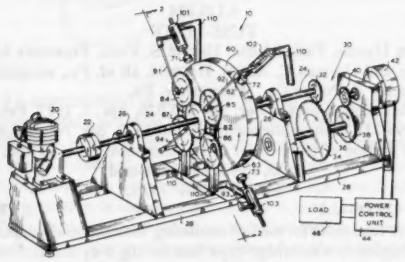
ENERGY STORAGE AND TRANSMISSION APPARATUS

Archie B. Gray, 4521 San Pedro Sq., Orlando, Fla. 32807

Filed Apr. 12, 1976, Ser. No. 675,994

Int. Cl.² F16F *15/30;* **H02K** *7/06, 21/22, 33/00*

U.S. Cl. 74—572 **12 Claims**



1. An energy storage and transmission apparatus comprising in combination:

a flywheel for storing kinetic energy in the rotational movement thereof, said flywheel having flywheel magnets attached thereto, said flywheel magnets being equidistantly spaced about a circumferential surface of said flywheel;

disengagable flywheel actuating means coupled to said flywheel for supplying rotary kinetic energy thereto;

coacting magnet means spaced from said flywheel for coacting with said flywheel magnets, said coacting magnet means comprising a plurality of peripheral magnets circumferentially spaced about said circumferential surface of said flywheel;

linkage means coupled between said coacting magnet means and said flywheel for moving said coacting magnet means in a timed relation with said flywheel magnets for imparting further rotation to said flywheel;

said linkage means further comprising eccentric means coupled between said flywheel and said peripheral magnets for transforming the rotational motion of said flywheel into linear motion of said peripheral magnets and said linear motion of said peripheral magnets being directed radially towards a center of rotation of said flywheel; and

power take off means coupled to said flywheel for removing kinetic energy therefrom.

4,128,021

DIFFERENTIAL MECHANISM

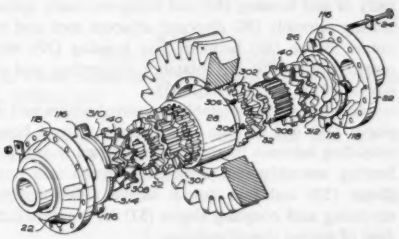
Reginald Knowles, Montrose, The Cliffe, Tansley, Matlock, Derbyshire, England

Filed Mar. 29, 1977, Ser. No. 782,447

Claims priority, application United Kingdom, Apr. 5, 1976, 13736/76

Int. Cl.² F16H *35/04*

U.S. Cl. 74—650 **7 Claims**

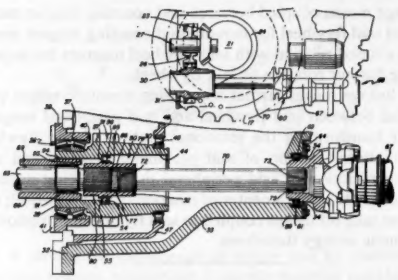


1. A differential mechanism including a pair of toothed-plate elements drivably connected to a cage assembly; a pair of toothed reaction members for driving respective output shafts extending through opposite sides of said cage assembly; a central toothed abutment member between the pair of toothed reaction members; respective axially-movable intermediate toothed-plate members disposed between the first mentioned toothed-plate elements and the reaction members; and means coupling together the intermediate toothed-plate members and the central abutment member for simultaneous rotational movement; the teeth of the toothed-plate elements and of the central toothed abutment member, and the teeth which are formed on front and back faces of the reaction members, being radiating teeth having flanks which are inclined relative to the general planes of the elements, the arrangement being such that, when the reaction members are being driven at a common rate of rotation, their driving disc portions abut against the central abutment member without relative movement and receive drive equally but such that, when one of the reaction members is required to rotate faster than the other, it can "precess" relative to the other by its teeth sliding up and down the flanks of the teeth of the central abutment member and of the intermediate plate member between which it is disposed, accompanied by alternate axial movements in opposite directions.

4,128,022
ROTATABLE SHAFT COUPLING

Arthur J. Ritter, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 14, 1977, Ser. No. 768,121
Int. Cl.[2] F16H *47/02*
U.S. Cl. 74—694 9 Claims



5. A rotatable coupling assembly mounted within a housing (33) having openings (37, 63) at opposite ends (32, 59) thereof, said coupling assembly comprising:

an output sleeve (30) rotatably supported by said housing (33) at one open end (32) thereof, said output sleeve (30) having an axial bore (50) extending between its respective opposed ends (35, 44) with one end (35) opening externally of said housing (33) and being internally splined;

a bearing assembly (36) disposed adjacent each end of said output sleeve (30) between said housing (33) and said output sleeve (30) for rotatably supporting said output sleeve (30) in said housing (33);

a coupling sleeve (52) rotatably supported within said output sleeve (30) and having an internally splined bore (77) extending between its respective opposed ends (79, 80);

a bearing assembly (54) disposed between said coupling sleeve (52) and said output sleeve (30) for rotatably mounting said coupling sleeve (52) for rotation independent of output sleeve rotation;

a first shaft (70) coaxial with said coupling sleeve (52) and having one end (72) externally splined and extending into one end (79) of the bore (77) of said coupling sleeve (52) to releasably connect said first shaft (70) therewithin, said first shaft being rotatably supported by said housing at the opposite open end (59) and extending through the opening (63) in said housing (33) at the end opposite said output sleeve (30);

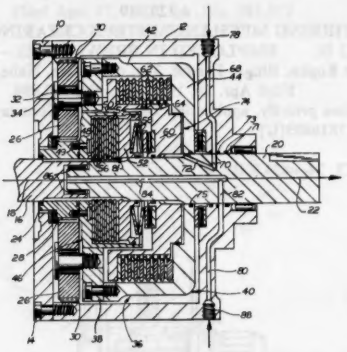
a second shaft (83) coaxial with said first shaft (70) having one end (85) externally splined and extending into the other end (80) of the bore (77) of said coupling sleeve (52) to releasably connect said second shaft (83) therewithin; and

a third shaft (88) coaxial with said first and second shafts (70, 83) and with said output sleeve (30), said third shaft (88) having an axial bore (89) extending between its respective opposed ends (93), said second shaft (83) being rotatably supported within the bore (89) and extending from one end (93) thereof into said coupling sleeve (52), one end (93) being externally splined and extending into said one end (35) of said output sleeve (30) to releasably connect said third shaft (88) therewithin, the other end of said third shaft (88) extending externally of one end of said housing (33), whereby said coupling sleeve (52) joins said first and second shafts (70, 83) together in coaxial relation for independent rotation relative to said third shaft (88).

4,128,023
COUPLING APPARATUS

Mark R. Kinder, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 19, 1976, Ser. No. 706,447
Int. Cl.[2] F16H *3/44;* F16D *25/00*
U.S. Cl. 74—750 R 11 Claims



1. Apparatus comprising a two-speed transmission unit for coupling a rotatable input shaft to a rotatable output shaft, said unit comprising a sun gear rotatable about a central axis thereof, means for fixedly mounting said sun gear on said input shaft for rotation in response to rotation of the input shaft, a ring gear encircling said sun gear, at least one planet gear in meshing engagement with said sun gear and said ring gear with the central axis of said planet gear adapted to orbit about the central axis of said sun gear, a planet carrier carrying said planet gear and rotatable therewith about the central axis of said sun gear, means supporting said planet carrier for rotation about an axis coaxial with the axes of said input shaft and said sun gear, first clutch means selectively engageable to connect said sun gear to said output shaft for rotating said output shaft at a first angular velocity equal to the angular velocity of said sun gear, second clutch means selectively engageable to connect said planet carrier to said output shaft for rotating said output shaft at a second angular velocity at a speed equal to the angular velocity of the planet carrier about the sun gear, means continuously biasing both of said first and second clutch means into engaged condition, and means for selectively placing either of said first and second clutch means in a disengaged condition, said biasing means serving to place both of said first and second clutch means in engaged condition to lock said input and output shafts against rotation whenever neither of said first nor said second clutch means is placed in disengaged condition.

4,128,024
FUSE-MATE

Irving Hyams, Philadelphia; Harold S. Koch, Plymouth Meeting, and Herman C. Aafjes, Hatfield, all of, Pa., assignors to Fischer & Porter Co., Warminster, Pa.

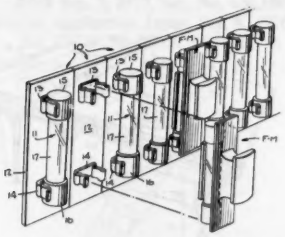
Continuation-in-part of Ser. No. 785,526, Apr. 7, 1977, Pat. No. 4,094,212. This application Oct. 26, 1977, Ser. No. 845,588
The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.
Int. Cl.[2] B23P *17/00*
U.S. Cl. 81—3.8 6 Claims

1. A fuse-mate formed of insulating material and adapted to be coupled to a cartridge-type fuse having a cylindrical casing whose ends are enclosed by terminal caps, said caps being engageable by the spring clips of a fuse holder, said fuse-mate facilitating the insertion or extraction of said fuse with respect to said holder and comprising:

A. a block-shaped socket whose length is substantially equal to that of said casing, said socket having a longitudinally-

extending channel formed therein adapted to accommodate said fuse casing, and lateral inlet jaws which are dilatable under pressure to admit an inserted casing into the channel, the jaws then reverting to their normal position in which they serve to lock the casing within the channel;

B. a shield whose underside is secured to the upper surface



of the socket and extending beyond either end thereof to overlie and protectively cover the caps of the socketed fuse; and

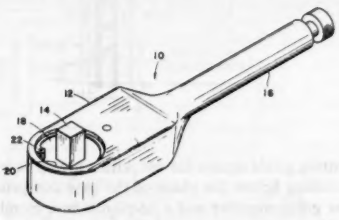
C. a handle secured to the upper side of the shield, the lower surface of said block defining a shelf to maintain said fuse in said channel when an outward pulling force applied to said handle to extract said fuse from the holder is resisted by said spring clips.

4,128,025

BOLT STARTING DEVICE

Harvey M. Main, 820 E. Grove, Dewey, Okla. 74029, and Doug Main, 12954 E. 32nd, Tulsa, Okla. 74134

Filed Aug. 8, 1977, Ser. No. 822,749
Int. Cl.[2] B25B *13/00*
U.S. Cl. 81—58.1 **6 Claims**



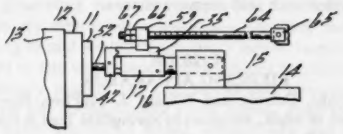
1. An improvement in a ratchet wrench having selectable ratcheting action to rotate a drive stud in either direction, and an elongated handle member, the improvement comprising a three position ratchet pawl switch, a first position to effect ratcheting action in one direction, a second position to effect ratcheting action in the opposite direction, and third position to effect disengagement of the ratcheting action, means to rotate the drive stud in either direction when the ratchet pawl switch is in the third position, and remote control member disposed at the outer end of the handle member and operably connected with the ratchet pawl switch and the means to rotate the drive stud for remote manipulation of said ratchet pawl switch and for remote rotation of said drive stud when said ratchet pawl switch is in said third position.

4,128,026

TOOL HOLDER

John R. Scaduto, 14460 E. State Fair, Detroit, Mich. 48205

Filed Dec. 23, 1975, Ser. No. 643,691
Int. Cl.[2] B23B *5/00*
U.S. Cl. 82—11 **1 Claim**



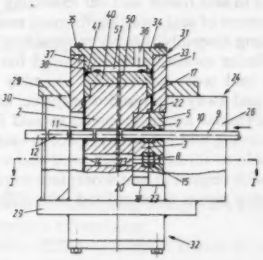
1. In a tool holder for advancing a cutting tip laterally of an advancing shank, a head on said shank having a recess, a slide holder within said recess for adjustment angularly therein, a dovetail slide in said holder, a stop plate adjustably supported on said slide, spring means biasing said stop plate forwardly of said head and shank, means for stopping said stop plate during its advancement to cause the slide and stop plate to stop and be advanced laterally as the slide holder and head continue to advance, means to angularly position said slide and slide holder in said recess, the stop plate and slide and the slide holder and head have aligned apertures, a dowel pin in the apertures in the stop plate and slide, a dowel pin in the apertures in the slide holder and head, and means for clamping said slide holder to the head and said slide to the stop plate after the adjustment thereof in said recess, the sides of said recess having portions which are parallel to each other along the direction of movement of the head, the remaining portions being parallel but at an angle to the first said portion.

4,128,027

SHEARING DEVICES

Ernst E. Fuchs, Schmerikon, Switzerland, assignor to Mecafina S.A., Switzerland

Filed Jul. 20, 1977, Ser. No. 817,128
Claims priority, application Switzerland, Jul. 23, 1976, 9494/76; Jul. 4, 1977, 8177/77
Int. Cl.[2] B26D *1/06, 3/16*
U.S. Cl. 83—198 **11 Claims**



1. A shear for severing sections of a profiled material comprising a cylindrical housing disposed horizontally and having it its wall a recess, a stationary shear beam removably mounted in said recess, a yoke on said housing mounted on both sides of said recess and bridging said recess, said stationary shear beam bearing against said yoke, a cylindrical body in said cylindrical housing, said cylindrical body having on one side a recess, a movable shear beam being removably mounted in said recess, each of said shear beams having at least one shear opening, said opening having a profile adapted to that of said material to be severed, said cylindrical housing and said cylindrical body having inlet and outlet openings for said material in alignment with the shear opening in the respective shear beam, a plurality of pressure pistons arranged in cylindrical bores inside said

cylindrical body and disposed above and below said openings in said cylindrical body for biasing the movable shear beam and the stationary shear beam towards one another transverse to the direction of motion of said cylindrical body, at least during severance of said profiled material, said cylindrical body being movable in said housing by a hydraulic driving mechanism, said housing being in communication with said bores provided with said pressure pistons.

4,128,028

PIERCING APPARATUS

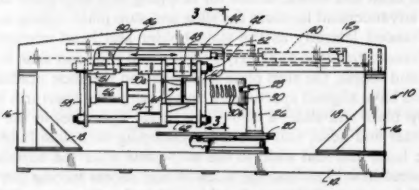
Jan C. Knibbe, Detroit, and Willard J. McPhee, Bloomfield Hills, both of Mich., assignors to Springfield Tool & Die, Inc., Dearborn, Mich.

Division of Ser. No. 596,995, Jul. 18, 1975, Pat. No. 4,038,894. This application Feb. 22, 1977, Ser. No. 770,525

The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

Int. Cl.[2] B26F *1/02*

U.S. Cl. 83—411 R **4 Claims**



1. Apparatus for performing work on a workpiece, said apparatus comprising;

a frame;

an index table mounted to said frame, said table being selectively rotatable about an axis;

means for mounting said workpiece to said table;

work performing means mounted to said frame and including a portion selectively movable in a direction substantially perpendicular to the axis of rotation of said index table to perform work on said workpiece in a different location at each rotated position of said table;

said work performing means comprising at least one bar mounted to said frame, said bar extending in the direction of movement of said work performing means, and a work performing assembly slidably mounted on said bars and a first cylinder means mounted to said bar for selectively moving said work performing assembly along said bar toward and away from said workpiece; and

a second cylinder means mounted to said frame for selectively moving said bar with respect to said frame and said index table to adjust the position of said work performing means with respect to said workpiece to permit said work performing means to be utilized with different size workpieces.

4,128,029

SUPPORT TABLE FOR CIRCULAR SAW

Danny Gay, Richmond; James Horine; James C. Hudson, both of Lexington; Joseph P. Sallee, and Hershel R. Wininger, both of Richmond, all of Ky., assignors to Irvin Industries, Inc., Stamford, Conn.

Filed Dec. 12, 1977, Ser. No. 859,963

Int. Cl.[2] B27B *5/22, 25/10, 27/06*

U.S. Cl. 83—437 **7 Claims**

1. A table to support and position a circular saw comprising:

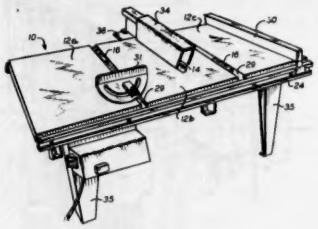
a table top having a work supporting surface and four legs supporting said table top,

said table top comprising first, second and third longitudinally spaced segments,

said first and said second table segments being spaced longitudinally a predetermined distance to provide a first lateral slot and said second and third table segments being spaced longitudinally a predetermined distance to provide a second lateral slot,

said first and second lateral slots providing first and second tracks for the rail of a mitre gauge,

a plurality of laterally spaced spacer elements and a plurality of vertically spaced spacer elements in each of said lateral slots, each of said spacer elements having a predetermined



width and being positioned between said table segments and in contact with the facing edges of said segments to provide a predetermined uniform width for said first and second lateral slots, and

front and back longitudinally disposed rails extending, respectively, across the front and back edges of said table segments and fastened to said table segments to provide front and rear rigid supports for said table segments.

4,128,030

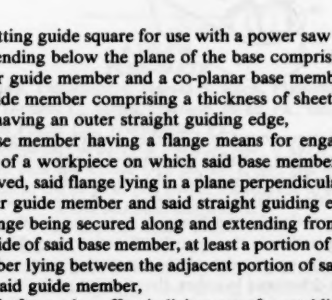
CUTTING GUIDE SQUARE

Peter Kundikoff, Rte. 1, Box 204, Escondido, Calif. 92025

Continuation-in-part of Ser. No. 584,134, Jun. 5, 1975, Pat. No. 4,028,976. This application Jun. 6, 1977, Ser. No. 803,616

Int. Cl.[2] B27B *9/04*

U.S. Cl. 83—745 **5 Claims**



1. A cutting guide square for use with a power saw having a blade extending below the plane of the base comprising:

a planar guide member and a co-planar base member,

said guide member comprising a thickness of sheet material and having an outer straight guiding edge,

said base member having a flange means for engaging the edge of a workpiece on which said base member may be received, said flange lying in a plane perpendicular to said planar guide member and said straight guiding edge,

said flange being secured along and extending from at least one side of said base member, at least a portion of said base member lying between the adjacent portion of said flange and said guide member,

blade-platform edge offset indicia means for establishing the distance by which the blade of a power saw is offset from the edge of the saw platform and for positioning the guiding edge of said square on a workpiece at the corresponding distance from the location of a line of intended cut,

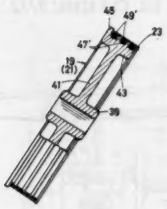
said guide member incorporating at least one finger grip

means comprising an opening for grasping said square and said workpiece through said square.

4,128,031
HORIZONTAL BANDSAW MACHINES

Masao Sato, Hatano, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Sep. 2, 1977, Ser. No. 830,180
Claims priority, application Japan, Sep. 8, 1976, 51-107591
Int. Cl.[2] B23D *55/08*; B27B *13/06*
U.S. Cl. 83—820 **2 Claims**

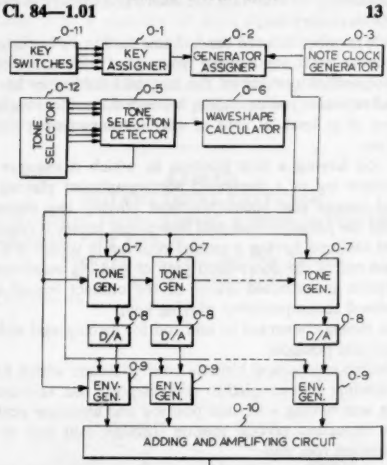


1. In a bandsaw having a bandsaw blade trained around at least one bandsaw wheel rotatably carried on a cutting head, the improvement comprising: laterally spaced grooves in the periphery of said wheel, said grooves each being dovetailed in cross-section with the wider groove section being at the groove bottom, and annular rubber-like members with round cross-sections received in said grooves and protruding therefrom beyond the wheel periphery to provide radial support for the bandsaw blade at a plurality of laterally spaced locations.

4,128,032
ELECTRONIC MUSIC INSTRUMENT

Ryoichi Wada, Habikino; Katsumi Fujisaki, Katano; Masaya Nakajima, Neyagawa; Masahiko Tsunoo, Suita, and Takeji Kimura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 30, 1975, Ser. No. 627,473
Claims priority, application Japan, Nov. 14, 1974, 49-131704
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **13 Claims**

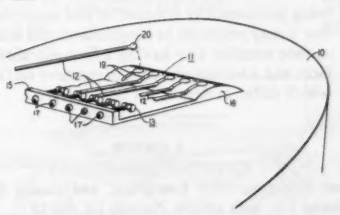


1. An electronic musical instrument comprising at least one tone selecting means for selecting musical tones; waveshape calculating means coupled to said tone selecting means for calculating a waveshape represented by amplitudes at two or more than two sampled points for the selected musical tone, said calculating means being operative whenever one of said tone selecting means is actuated; a plurality of waveshape memory means coupled to said waveshape calculating means for temporarily memorizing said calculated waveshapes; a plurality of clock signal generating means corresponding to said waveshape memory means, respectively, for generating clock signals with high frequencies corresponding to pitches of depressed keyswitches of said musical instrument, said clock signal generating means being operative whenever the keyswitches are depressed; a plurality of reading means corresponding to said waveshape memory means, respectively, and coupled to said waveshape memory means for repetitively and successively reading out said memorized waveshape amplitudes by the corresponding clock signals generated by said clock signal generating means, respectively; and converting means coupled to said reading means for converting said waveshape amplitudes read out by said reading means to a musical tone, whereby a musical tone is generated by repetitively reading out the temporarily memorized musical waveshape, wherein said tone selecting means comprises coefficient determining means for determining coefficients specifying the relative amplitude of each of harmonics of the tone signal, and wave waveshape calculatng means comprises sine wave memory means for memorizing amplitudes at two or more than two sampled points of a sine wave signal of one period; and said waveshape calculating means is operative whenever said coefficient determining means is actuated, and calculates and synthesizes the waveshape by repetitively calculating the amplitude of each sampled point of a waveshape, corresponding to tone signal selected by said tone selecting means, provided in accordance with the coefficient signal from said coefficient determining means and the amplitudes of the sine wave memorized in said sine wave memory means.

4,128,033
TAILPIECE

Phillip J. Petillo, 1206 Herbert Ave., Ocean, N.J. 07712

Filed Jul. 25, 1977, Ser. No. 812,102
Int. Cl.[2] G10D *3/12*
U.S. Cl. 84—299 **4 Claims**



1. In a mechanism for anchoring strings on a stringed instrument, the combination comprising:

a bridge assembly including support means for holding said string, lateral adjusting means for positioning said support means parallel to the surface of said instrument and vertical adjusting means for positioning said support means vertically with respect to the surface of said instrument, and

a tailpiece assembly including anchoring means for fixing the ends of said strings with respect to said instrument, said anchoring means including a raised shoulder which is massive in cross section and is perforated by a plurality of generally upwardly directed, communicating slots-and-socket pairs wherein each slot defines a string bearing ramp and each socket is adapted to anchor a string, frame means for supporting said lateral adjusting means and seat means for supporting said vertical adjusting means, said seat means rigidly joining said anchoring and frame means to form a single unitary structure.

4,128,034

PRESSURE BAR FOR A CAPO TASTO

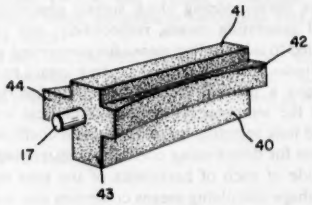
Elliott L. Myerson, 1815 Grismer St., Burbank, Calif. 91504, and Richard W. Gillis, 5661 Cleon St., North Hollywood, Calif. 91601

Continuation-in-part of Ser. No. 650,147, Jan. 19, 1976, Pat. No. 4,048,894. This application Jun. 20, 1977, Ser. No. 807,797

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.[2] G10D *3/04*

U.S. Cl. 84—318 **4 Claims**



1. An improved pressure bar to be used in combination with a capo tasto, which attaches itself to a stem of a stringed instrument, having a fret board and strings adjacent to the fret board, and which depresses the strings against the fret board, the capo tasto includes:

a. mounting means for mounting said pressure bar on the stem of the stringed instrument so that it is disposed perpendicular to the longitudinal axis of the stem and parallel to the transverse axis of the stem adjacent to the fret board; and

b. pressure applicating means for applying pressure to the surface of the stem oppositely disposed to the surface on which the fret board is placed so that the pressure is transmitted through said mounting means to said pressure bar, said pressure applicating means coupled to said mounting means, said improved pressure bar, comprising:

a. a multi-surface member having a length adapted to extend across the fret board, said multi-surface member being mechanically coupled to said mounting means so that it may rotate on its longitudinal axis and said multi-surface member also having a first plurality of flat surfaces and a second plurality of concave surfaces, each of which differ in degrees of concavity.

4,128,035

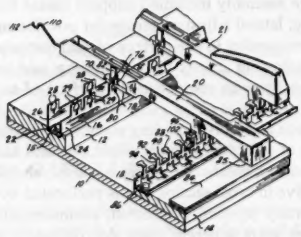
KEYBOARD ASSEMBLY

Norman Erickson, 1328 Evergreen, and James Meier, 1033 Crabtree La., both of Des Plaines, Ill. 60016

Filed Jun. 25, 1976, Ser. No. 699,946

Int. Cl.[2] G10C *3/12*; G10H *1/00*

U.S. Cl. 84—433 **15 Claims**



1. A keyboard assembly having an elongate key member, said key member having a downwardly extending pivot wall, a pair of pivot members supported below said pivot wall, said pivot members each having a pointed portion with the pointed portions of said pair facing each other, said pivot wall being received between said pointed portions and pivotally supported thereby.

4,128,036

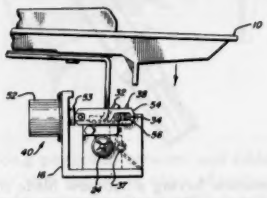
ELECTRO-MECHANICAL KEYBOARD MEMORY FOR AN ELECTRONIC MUSICAL INSTRUMENT

Donald R. Sauvey, Palatine, and Robert E. Magnuson, Mt. Prospect, both of Ill., assignors to Hammond Corporation, Chicago, Ill.

Filed Sep. 17, 1976, Ser. No. 724,166

Int. Cl.[2] G10C *3/12*

U.S. Cl. 84—441 **4 Claims**



1. An electro-mechanical memory device for use in a keyboard electronic musical instrument having a plurality of accompaniment chord and bass note playing keys and a plurality of melody playing keys both depressible by an instrument player and returnable to a horizontal position after the downward pressure from said instrument player is removed comprising:

at least 20 contact leg members each attached to the bottom of a different one of said accompaniment playing keys and extending downward therefrom;

a lower stationary bar rotatably mounted below said accompaniment playing keys;

a plurality of support arms spaced apart and attached to said stationary bar and extending upwardly therefrom;

an upper retention rod attached to said support arms and extending parallel to said stationary bar, said support arms positioning the retention rod above and slightly in front of said stationary bar;

a guide member secured beneath said stationary bar intermediate its ends for limiting downward movement of the intermediate portion of the bar, said stationary bar and said retention rod extending beneath the contact leg members of at least 20 keys of said accompaniment playing keys;

said rod having a first position in which it engages said contact leg of a depressed accompaniment playing key and retains said accompaniment playing key depressed after the pressure from said instrument player is removed, and said rod having a second position in which it is pivoted out of the downward path of said leg members and permits unrestricted travel of the contact leg of a depressed accompaniment playing key;

a bias means connected to said rod for forcing said rod into said first position;

an electro-mechanical bistable control means which has an extending arm coupled to said retention rod, said extending arm having a normal position and a release position, for imparting pivotal motion through said arm to said retention rod; and

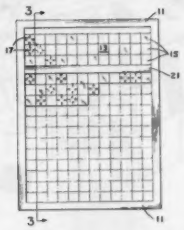
the extending arm of said control means in said normal position forcing said rod to pivot into said second position and the extending arm of said control means in said release position allowing said bias means to force said rod to pivot into said first position so that when one or more of said accompaniment playing keys are substantially simultaneously depressed said contact leg of each depressed accompaniment playing key engages said retention rod

and each said accompaniment playing key remains depressed.

4,128,037
APPARATUS FOR DISPLAYING PRACTICE LESSONS FOR DRUMMERS

Nicholas J. Montemurro, 128 Sanford Ave., Lyndhurst, N.J. 07071

Filed Jun. 30, 1977, Ser. No. 811,635
Int. Cl.[2] G09B *15/02*
U.S. Cl. 84—476 **5 Claims**



1. Apparatus for scoring and displaying indicia in the nature of notation for the playing of a percussion instrument such as a drum or the like, comprising in combinating:

a frame defining an enclosed area and also defining a generally planar base

a plurality of tiles, each of said tiles having in said base plane the same general dimensions as the other tiles in said plurality, said tiles being disposable within said frame so as to substantially fill said area in tesselated array,

at least some of said tiles bearing indicia relating to the playing of said percussion instrument,

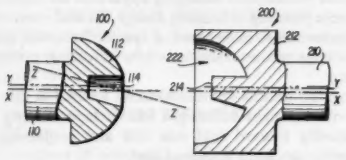
said tiles being interchangeable as to their respective positions in said tesselated array,

said indicia and said respective positions cooperating to display information constituting a rhythmic pattern to be played on said percussion instrument, and at least some of said tiles being provided with a plurality of indicia associated with a plurality of sides of said tiles, said indicia associated with any one of said tile sides of any respective tile being the same as the indicia associated with each of the other of the sides of said respective tile thus providing for said tiles to be viewed and read in a plurality of angular directions.

4,128,038
ROTARY DRIVE FASTENER

Peter T. Urwin, Fergus, Canada, assignor to Pay Television Corporation, N.w York, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,351
Int. Cl.[2] F16B *23/00*
U.S. Cl. 85—45 **2 Claims**



1. Rotary drive fastener providing integral construction which is preclusive of compromise, comprising:

(A) fastening means having a central axis at extremes of which are driving and driven ends;

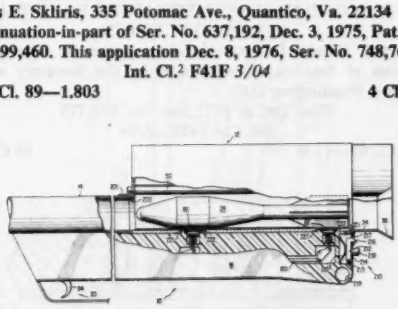
(B) a driver engageable head on the driving end of the fastening means, said head having its central axis aligned with the central axis of the fastening means, the head in exterior configuration, forming a hemispherical dome;

(B1) a tapered asymetric cavity located generally centrally within the dome of the head, said cavity defining a circular open outer end and a circular closed inner end, the inner end being of smaller dimension than the outer end, the center of the open outer end being coaxial with the central axis of the head and the center of the closed inner end being offset therefrom, the respective ends of the cavity being concentric to each other, said asymetric cavity comprising two portions interconnecting the open outer end and the closed inner end, one portion of the cavity being generated about a first axis which is parallel to said central axis and a second portion of the cavity being generated about a second axis which is at an acute angle relative to the central axis of the head and fastening means, the respective second axis of the cavity and central axis of the head and fastener intersecting at the top of the head whereby the cavity in said dome provides means for the engagement of a corresponding tool having a recessed head for the application of torsional force to the fastener, said fastener being, by reason of the positioning of the axis described above, subject to captivation, the bottom portion of the cavity serving as a repository for the transfer of torque from the driver tool by means of a driving pin.

4,128,039
ROCKET LAUNCHING MECHANISM

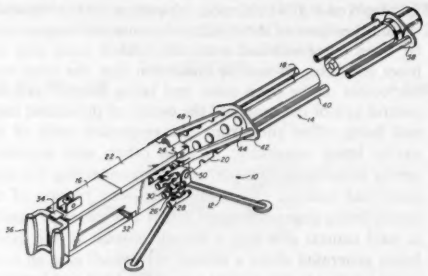
Lewis E. Skliris, 335 Potomac Ave., Quantico, Va. 22134

Continuation-in-part of Ser. No. 637,192, Dec. 3, 1975, Pat. No. 3,999,460. This application Dec. 8, 1976, Ser. No. 748,767
Int. Cl.[2] F41F *3/04*
U.S. Cl. 89—1.803 **4 Claims**



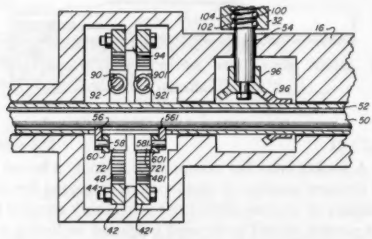
1. A rocket launcher comprising: a stock; a barrel mounted on a forward portion of said stock; a magazine for containing a plurality of rockets to be fired removably secured to a rearward portion of said stock; said magazine including a cylindrical outer housing member, an inner rotor member rotably mounted within said housing member, said rotor member having a plurality of longitudinally extending grooves cooperating with said housing member, each defining a rocket chamber, means for rotationally driving said rotor member with respect to said housing member, and door means in said housing member for access to a chamber for loading and removing rockets; means carried by said stock for stopping the rotation of said rotor member when a said chamber is aligned with said barrel; means carried by said stock for firing a rocket in a chamber aligned with said barrel; and releasable latch means for securing said magazine to the assembly of said stock and barrel.

4,128,040
BLANK FIRING ADAPTER
Robert C. Schuetz, 2125 Quiemuth St., Olympia, Wash. 98503
Filed Jun. 2, 1977, Ser. No. 802,687
Int. Cl.[2] F41D *11/00*
U.S. Cl. 89—14 E 8 Claims



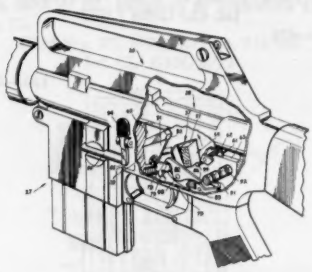
1. A blank firing adapter for a gun having a longitudinally reciprocating barrel, said adapter comprising:
a muzzle restricter adapted to fit over the end of a gun barrel when said barrel is extended forwardly,
a U-shaped member having a base portion adapted to pass across the feed tray of said gun where cartridges in an ammunition belt are fed into said gun, said base portion preventing passage of live cartridges into said gun while permitting passage of blank cartridges,
said U-shaped member having legs extending forwardly to engage said muzzle restrictor, and
means maintaining said muzzle restrictor in fixed position when said gun barrel reciprocates rearwardly.

4,128,041
WEAPON ELEVATING MECHANISM HAVING AN AUTOMATIC CLUTCH
Robert J. Schulz, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Oct. 3, 1977, Ser. No. 838,775
Int. Cl.[2] F41F *21/04*
U.S. Cl. 89—41 R 10 Claims



1. An artillery elevating mechanism for elevating a gun tube and cradle, said mechanism comprising:
a non-rotatable sleeve housing **32** attached to said gun tube and cradle,
a rotatable shaft **54** within said housing operable on rotation to adjust the elevation of said housing,
said rotatable shaft being geared to and driven by an outer output shaft **52**,
a manually operable rotatable inner input shaft **50**,
clutch means interconnecting said input shaft with said output shaft whereby rotation of said input shaft adjusts the elevation of said gun tube and cradle.

4,128,042
AUTOMATIC BOLT CATCH RELEASE APPARATUS FOR FIREARM
Maxwell G. Atchisson, 6695 Ridgemoore Dr., Doraville, Ga. 30360
Continuation of Ser. No. 645,362, Dec. 30, 1975, Pat. No. 4,057,003. This application Jul. 25, 1977, Ser. No. 818,768
Int. Cl.[2] F41D *11/00*
U.S. Cl. 89—138 3 Claims



1. Bolt catch automatic release apparatus for an **M16** firearm which has been converted to fire with an open bolt, and which includes a receiver housing, a reciprocating bolt mechanism mounted within said receiver housing, and a hammer-operated firing pin carried by said bolt mechanism, comprising;
sear means disposed within said receiver housing and selectably operative to engage and retain said bolt mechanism in a fireable open position;
trigger means operatively associated with said sear means to move said sear means so that said bolt mechanism moves forward from said fireable open position to a closed firing position to fire a round;
a bolt catch which retains said bolt mechanism in a non-fireable open position independently of said sear means in response to firing the last round in a magazine;
magazine release means operative to release a magazine from said firearm; and
means operative in response to operation of said magazine release means to release said bolt catch so that said bolt mechanism can move forward from said non-fireable open position into engagement with said sear means for retention in said fireable open position by said sear means, so that said converted open-bolt firearm is in fireable condition when a fresh magazine is substituted for the released magazine.

4,128,043
TOOL CHANGER APPARATUS
Reinhold Grassl, 142 S. Miraleste Dr., Apt. 203, Miraleste, Calif. 90732
Continuation-in-part of Ser. No. 664,880, Mar. 8, 1976, abandoned. This application Jan. 10, 1977, Ser. No. 757,987
Int. Cl.[2] B23C *5/26*
U.S. Cl. 90—11 D 21 Claims

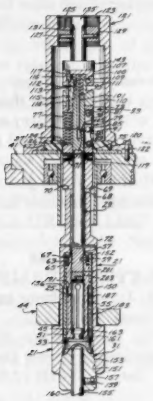
1. A quick release tool changing apparatus for holding a tool holder, incorporating a holding flange formed concentrically with a frustoconical male taper, a spindle movable between a holder locking position and a holder releasing position, and comprising:
an elongated hollow spindle housing formed at one extremity with a socket defining a female taper flaring radially outwardly toward said one end and projecting axially therefrom to form a second end;
a hollow closer mounted on said one end of said spindle;
gripper means received in said closer and operable upon axial shifting in the direction opposite said one end to engage said closer and close on said flange and upon further axial shifting in that direction to engage said male

taper with said female taper to center said tool holder in said socket;

an elongated draw bar connected on one end with said gripper means and projecting through said spindle housing to said second end;

an actuator mounted on said apparatus proximate said second end and including a radially inwardly facing actuating surface;

elongated locking toggle link means interposed between said second end of said spindle and said draw bar and including a pair of longitudinal toggle links pivotally connected on their remote ends from said second end of said spindle and said draw bar, respectively, and further being pivotally connected together on their proximate ends and being pivotable about such remote ends from a collapsed release position with said proximate ends disposed radially outwardly from alignment between said remote ends to a locked, tightening position with said proximate ends pass-



ing a position of alignment between said remote ends to draw said draw bar toward said one end relative to said spindle housing, one of said proximate ends being further formed with a radially outwardly facing cam surface for engaging said actuating surface upon relative longitudinal movement between said actuator and toggle link means to urge said toggle link means to said locked position; and

release means mounted on said apparatus proximate said second end of said spindle, including an axial release bore formed in said draw bar, a release pin telescopable axially in such bore and pusher means engagable between one end of said pin and the proximate ends of said links, said pin being operative upon axial shifting in one direction thereof in said bore to engage said pusher means and pivot said proximate ends of said link means radially outwardly to said releasing position to extend said draw bar to disengage said gripper means from said closer, allowing said gripper means to open thereby releasing said tool holder.

4,128,044

METHOD OF CONTROLLING APPARATUS AND SERVOACTUATOR THEREFOR

Gerald L. Larson; William A. Treadwell, and James Seaver, all of Battle Creek, Mich., assignors to Eaton Corporation, Cleveland, Ohio

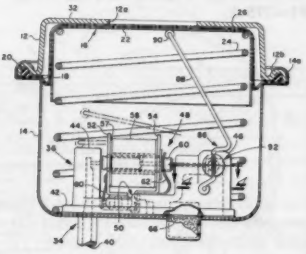
Filed Sep. 27, 1976, Ser. No. 726,728
Int. Cl.[2] F15B *13/044*
U.S. Cl. 91—20 **14 Claims**

1. The method of controlling plural functions of an apparatus in response to an electrical input control signal comprising the steps of:

(a) providing a housing defining a fluid pressure chamber and having port means venting same to the atmosphere, and pressure port means adapted for connection to a source of fluid pressure for communicating fluid pressure to said chamber;

(b) moving a valve member alternately between a position closing said pressure port means and a position closing said vent port means for controlling fluid therethrough in response to said electrical input signal;

(c) providing actuator means movable in response to the fluid pressure level in said chamber;



(d) providing an auxiliary valve member movable with respect to said vent and pressure port means; and

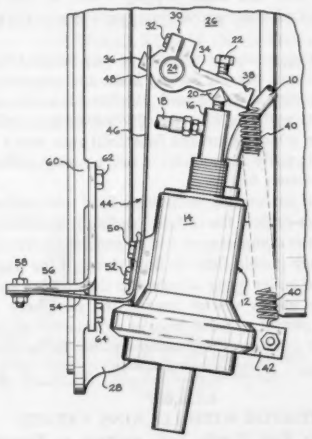
(e) sensing movement of said actuator means and moving said auxiliary valve member relative to said actuator means in response to said sensed movement for controlling the effective flow area of said vent port means.

4,128,045

SYSTEM FOR ROTATING A CONTROL SHAFT

William H. Sink, Auburn, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 15, 1977, Ser. No. 815,810
Int. Cl.[2] F01B *15/02;* **F16D** *25/08*
U.S. Cl. 91—217 **7 Claims**



1. A system for rotating a control shaft comprising:

support means including means for journalling the control shaft;

lever means secured to the control shaft having at least two radially extending arm members;

a motor having at least two extensible members;

means interconnecting one of the extensible members of said motor to one of the arms of said lever means;

means interconnecting the other of the extensible members of said motor to the other arm member of said lever means; and

leaf spring means connecting said motor to said support

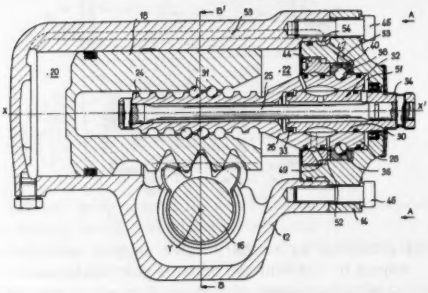
means whereby during operation said motor may cant relative to said support means.

4,128,046

POWER STEERING MECHANISM

Jorge E. Rosell, Barcelona, Spain, assignor to Bendiberica, S. A., Barcelona, Spain

Filed Jan. 7, 1977, Ser. No. 757,809
Int. Cl.[2] F15B *9/10*; F16J *11/02*
U.S. Cl. 91—375 A **6 Claims**



1. A power steering mechanism comprising:
a housing supporting a steering member and having a cover;
a piston movably mounted within the housing to form pressure chambers and connecting with the steering member;
a shaft coupled to said piston; and
a pressure fluid distributor valve communicating with the pressure chambers; said pressure fluid distributor valve including a sleeve moving in unison with said shaft and a rotor disposed within said sleeve;
said shaft and said rotor being connected to opposite ends of a torsion bar, said shaft forming a bore at one end for receiving said rotor and defining said sleeve at the bore; and
said shaft being rotatably mounted in said housing by means of a ball thrust bearing having inner and outer ball races for supporting at least two balls therebetween, said ball thrust bearing being substantially defined by a groove in the sleeve which forms the inner ball race and a pair of rings held axially and radially in said housing cover which forms the outer ball race;
said cover of the housing including a fluid inlet orifice and a fluid outlet orifice, the orifices leading respectively to an annular inlet compartment and an annular outlet compartment which enable fluid to flow through the distributor valve, said cover being attached to the housing by identical fixing means spaced around the periphery of said cover to permit variable angular orientation of the inlet and outlet orifices of said cover relative to the housing.

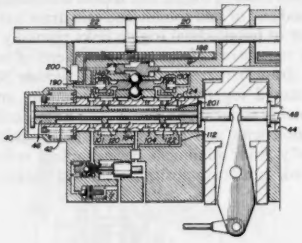
4,128,047

ACTUATOR WITH LOCKING VALVES

Jose G. Caero, Fort Worth, Tex., assignor to Textron Inc., Providence, R.I.

Continuation of Ser. No. 604,625, Aug. 14, 1975, abandoned. This application Jul. 14, 1977, Ser. No. 815,675
Int. Cl.[2] F15B *11/08, 13/04*
U.S. Cl. 91—420 **9 Claims**

1. A valve system for controlling the flow of fluid from a pressure fluid source to a hydraulic actuator having an actuator piston which comprises:
a primary spool responsive to translation in a control range to supply pressurized fluid from said pressure fluid source to one side of said piston and receive fluid flow from the other side of said piston,
a plurality of blocking valves in fluid communication with said primary spool and said piston,
means operable when said spool is in said control range and pressurized fluid is present in said system for maintaining said blocking valves open and operable when said spool is in said control range and upon loss of pressurized fluid for closing said blocking valves to prevent movement of said



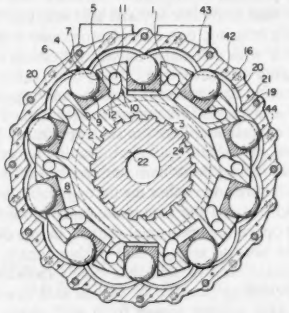
piston during pressure loss, thereby permitting said piston to resist reactive loads exerted thereon, and
means associated with said primary spool and responsive to over travel of said primary spool outside of said control range to open said blocking valves, thereby equalizing pressure on both sides of said piston to permit movement of said piston during a pressure failure.

4,128,048

RADIAL PISTON TYPE HYDRAULIC PUMP-MOTOR

Kenzo Nishiba, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Dec. 16, 1976, Ser. No. 751,321
Claims priority, application Japan, Dec. 27, 1975, 51-157533
Int. Cl.[2] F01B *13/06*
U.S. Cl. 91—491 **11 Claims**



1. A radial piston type hyraulic pump-motor comprising:
a cylinder block formed with a plurality of radial cylinders circumferentially equally spaced and each opened at its radially outer end;
a plurality of piston assemblies each radially slidably accommodated in each of said radial cylinders of said cylinder block to provide a cylinder chamber defined by said radial cylinder and said piston assembly;
a plurality of inlet-outlet passages each including a horizontal bore disposed between said adjacent two piston assemblies and radially outwardly of a radially inner end of said radial cylinder, said horizontal bore horizontally extending throughout and opened at the side faces of said cylinder block, and a cylinder bore having one end opened at said cylinder chamber defined when said piston assembly is moved to the radially inward stroke end and the other

end communicated with the longitudinally intermediate portion of said horizontal bore;

a housing accommodating therein said cylinder block and said piston assemblies and having a radially inner face held in contact with the radially outer ends of said piston assemblies;

at least an introducing passage partially formed in said housing and including a main introducing passage having one end exteriorly opened and a plurality of branch introducing passages having one ends opened in communication with the other end of said main introducing passage and the other ends opened circumferentially equally spaced and communicatable with the other ends of said inlet-outlet passages;

at least a discharge passage partially formed in said housing and including a main discharge passage having one end exteriorly opened and a plurality of branch discharge passages having one ends opened in communication with the other end of said main discharge passage and the other ends opened circumferentially equally spaced and communicatable with the other ends of said inlet-outlet passages in alternative relation with the other ends of said branch introducing passages; and

a shaft connected rotatably with said housing and coupled with said cylinder block.

4,128,049

APPARATUS FOR MANUFACTURE OF PAD STACKED BAGS OR THE LIKE

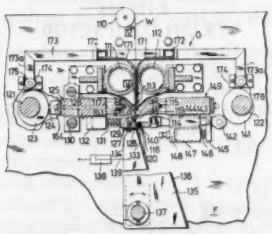
Hans Lehmacher, Hummerich, 5216 Niederkassel-Mondorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 282,193, Jul. 17, 1972, Pat. No. 3,966,524, and Ser. No. 567,073, Apr. 10, 1975, Pat. No. 4,046,257. This application Nov. 14, 1975, Ser. No. 632,141

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1971, 2141045; Jun. 19, 1972, 2229728; Jul. 7, 1972, 2233408; Jul. 26, 1972, 2236523

Int. Cl.[2] B31B *23/00*

U.S. Cl. 93—33 H **62 Claims**



1. Apparatus for manufacture, from thermoplastic synthetic plastic film in the form of a longitudinally advanced continuous two-layer web, of bags such as carrying bags or the like packaging, stacked and connected with one another through welding into a tear-off type pad, comprising:

cooperating opposed jaws on opposite sides of a web path with at least one jaw reciprocatingly movable relative to the other in a plane perpendicular to the web advancing in said path, the jaws operating on the web to produce a bag and including a web severing device to separate it from the web, and

a bag stacking and padding device located, in the direction of web motion, immediately beyond the severing device,

said stacking device including a reciprocating padding welding device for welding each of the successively produced bags to the preceding bag as each is added to a bag stack being formed;

the said severing device and said padding welding device moving in parallel planes.

4,128,050

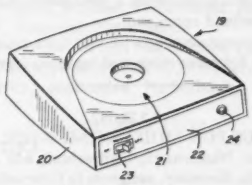
BEVERAGE BREWER STRUCTURE

Stanton H. Petry, Arlington Heights, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Filed Feb. 27, 1976, Ser. No. 661,843

Int. Cl.[2] A47J *31/00*; A23F *1/08*

U.S. Cl. 99—304 **9 Claims**



1. A beverage brewer structure comprising: a beverage brewing apparatus having a heating tank and top portion defining an upwardly opening basin for conducting water to said tank and having an opening defined by a wall portion thereof; a cover selectively overlying said basin; removable securing means extending through said cover and engaging a connecting portion of the tank for selectively retaining the cover in overlying relationship to said basin; a warmer station having a heater for heating a decanter placed thereon and control means for controlling operation of the heater; and wall means on said warmer station for engagement by said securing means for selectively permitting the warmer station to be used selectively (a) separately from the brewing apparatus, and (b) mounted on said cover and secured thereto by said securing means, as desired, said warmer station wall means comprising a bottom wall thereof and said securing means extending through said basin opening and securing said bottom wall to said tank in closely superposed relationship to said cover.

4,128,051

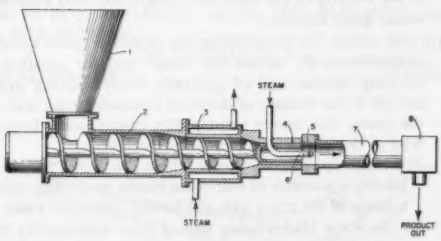
PROTEIN TEXTURIZATION BY EXTRUSION WITH INTERNAL STEAM INJECTION

William M. Hildebolt, Mickleton, N.J., assignor to Campbell Soup Company, Camden, N.J.

Division of Ser. No. 645,614, Dec. 31, 1975, Pat. No. 4,039,691. This application May 16, 1977, Ser. No. 797,420

Int. Cl.[2] A23P *1/00*

U.S. Cl. 99—348 **5 Claims**



1. Apparatus for texturizing protein material comprising:

(a) means for mixing a source of protein and water to form a protein dough;

(b) means communicating with said means for mixing for advancing said dough without imparting excessive work to said dough;

(c) means communicating with said means for advancing for extruding said dough in the form of continuous tubular shell of semi-rigid material;

(d) means for blowing said protein shell into discrete pieces of irregularly shaped protein material, said means for blowing said shell into pieces comprising means for inject-

ing a gaseous stream into the interior of said shell as said shell leaves said means for extruding;

(e) means defining a confined treating zone communicating with said extrusion means whereby said injected gaseous stream propels said pieces into and through said confined zone;

(f) back pressure maintaining means disposed at the discharge end of said confined zone, said back pressure maintaining means maintaining a predetermined back pressure to said confined zone; and

(g) means communicating with said back pressure maintaining means for recovering said texturized protein material.

4,128,052

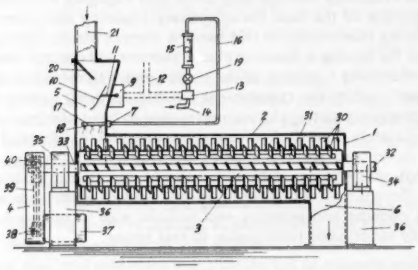
APPARATUS FOR MOISTENING WHOLE GRAINS

Roman Mueller, Niederuzwil, Switzerland, and Josef Kalapos, Mommenheim, Germany, assignors to Gebrueder Buehler AG, Uzwil, Switzerland

Continuation of Ser. No. 547,357, Feb. 5, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,919

Int. Cl.[2] A23B *9/00*

U.S. Cl. 99—516 **28 Claims**



1. Apparatus for uniformly moistening whole grain kernels to a predetermined uniform moisture content in preparation for milling, comprising:

(a) a closed, circular vessel having an inlet at one end through which whole grain kernels may be admitted and an outlet at the other end through which uniformly moistened kernels may be discharged, the vessel defining an inner circumferential wall;

(b) means for metering quantities of water within the vessel in the vicinity of the inlet for contact with said admitted whole grain kernels;

(c) and means for accelerating the admitted grain kernels circumferentially within the vessel and for creating a whirling tubular veil of generally freely moving grain kernels in the vicinity of the inner circumferential wall of the vessel that moves substantially continuously lengthwise of the vessel, and means comprising

(i) a rotor that extends axially within the vessel, the rotor having a plurality of individual blades projecting transversely of the rotor axis and having free outer ends;

(ii) the rotor blades being spaced over substantially the entire length of the rotor and generally uniformly spaced around its circumference, the blades numbering at least twenty blades for each square meter of surface area of the inner circumferential wall;

(iii) and means for rotating the rotor at a speed requisite for imparting to the outer ends of the blades a circumferential velocity of between substantially 6 m. per second and 30 m. per second,

(d) whereby said whole grain kernels are impacted within the whirling tubular veil by the rotating blades and caused to frictionally engage each other, thereby effecting uniform moistening of the grain kernels.

4,128,053

SUPERCALENDERS

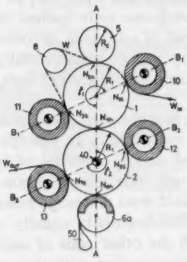
Matti Kankaanpää, Espoo, Finland, assignor to Valmet Oy, Finland

Filed Jun. 16, 1977, Ser. No. 807,298

Claims priority, application Finland, Jun. 17, 1976, 761764

Int. Cl.[2] B30B *3/00*

U.S. Cl. 100—162 R **23 Claims**



1. In a supercalender, an upright series of metal rolls defining between themselves a plurality of hard nips and including top and bottom end rolls and between the latter at least a pair of intermediate rolls one of which is an upper intermediate roll situated next to said top roll and the other of which is a lower intermediate roll situated next to said bottom roll, and at least two filled rolls situated next to at least one of said pair of intermediate rolls and defining therewith a pair of soft nips, so that a web travelling around said one intermediate roll between the latter and said two filled rolls and between said one intermediate roll and one of said end rolls will be subjected at said one intermediate roll to at least three nips at least one of which is a hard nip defined between said one end roll and said one intermediate roll and the other two of which are soft nips defined between said two filled rolls and said one intermediate roll.

4,128,054

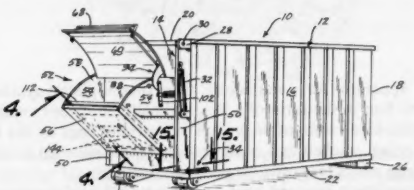
TRASH COMPACTOR

Louis A. Chenot, Grundy Center, Iowa, assignor to Mid-Equipment, Inc., Grundy Center, Iowa

Continuation-in-part of Ser. No. 789,348, Apr. 21, 1977. This application Nov. 1, 1977, Ser. No. 847,664

Int. Cl.[2] B30B *15/06*

U.S. Cl. 100—233 **2 Claims**



1. A compactor comprising:

a container having side walls, top and bottom walls and an end wall;

a compactor blade pivotally mounted adjacent one end of said container for pivotal movement about a horizontal axis from an initial position to a compacting position, said compactor blade having upper and lower ends, said compactor blade being pivotally mounted adjacent its lower end;

power means connected to said compactor blade for pivotally moving said compactor blade;

a curved plate mounted on the lower end of said compactor blade having a radius defined by said horizontal axis;

and a stationary flat plate positioned below said curved plate and closely spaced therefrom for preventing refuse from passing beneath the lower end of said compactor blade.

4,128,055

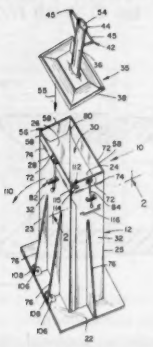
MANUAL TRASH COMPACTOR

James J. Hellmann, 6600 SW. 127th St., Miami, Fla. 33156

Filed Jul. 13, 1977, Ser. No. 815,221

Int. Cl.[2] B30B *1/04*

U.S. Cl. 100—245 **27 Claims**



1. A manual trash compactor comprising:

A. a housing adapted to receive therein a bag having upstanding walls terminating in an open top for containing the trash,

B. said housing comprises a base with panels extending vertically and upwardly from said base and terminating in an upper open end, such that a rectangular configuration is formed to gain access to said housing,

C. pressure applying means for compacting the trash within the bag,

D. weighting means associated with said pressure applying means to increase the weight thereof to facilitate the compacting of the trash within the bag,

E. retaining means for releasably securing the open top of the bag within said housing during operation of said pressure applying means,

F. said retaining means comprises a plate operatively associated with at least two of said panels to provide retention of the open top of the walls of the bag in fixed relationship to said panels,

G. mounting means for pivotally securing each one of said plates with respect to one of said panels between an open position and a closed position, said open position permitting the bag to be removed from said housing and said closed position compressing the upstanding walls of the bag against said panels,

H. latching means for releasably retaining each one of said plates in said closed position,

I. said plates each include an upper section and a lower section, and said lower section in the closed position of said plate extending in overlapping relationship to a corresponding one of said panels with the portion of the wall of the bag extending therebetween, so as to have the bag supported at its open top such that trash may be received therein,

J. said upper section extends above said upper open end of said housing in said closed position, with said latching means including a latch operable with each one of said plates, and said latch is coupled to said panel and said plate and operable to maintain said plate in said closed position, and

K. each said plate is hingeably mounted on one of said panels intermediate said upper section and said lower section.

4,128,056

PLASTICALLY DEFORMABLE, INELASTIC STENCIL END RING CONNECTION

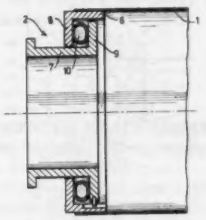
Jacobus G. Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Continuation-in-part of Ser. No. 582,814, Jun. 2, 1975, abandoned. This application Feb. 4, 1977, Ser. No. 765,777

Claims priority, application Netherlands, Jul. 2, 1974, 7408974

Int. Cl.[2] B41F *15/38*

U.S. Cl. 101—128.1 **5 Claims**



1. A cylindrical stencil for a rotary screen printing machine comprising a thin-walled screen sleeve and two end rings on the ends of said sleeve, at least one end ring comprising two coaxial parts each having a flange, a connection between said coaxial parts and said connection being movable but free from play in a direction of rotation of said sleeve and end rings, said connection comprising a plastically deformable inelastic member disposed between and in contact with said flanges such that a straight mounting of said cylindrical stencil with reference to the driving member is obtained without applying an uneven load to the stencil.

4,128,057

STENCIL PAPER ASSEMBLY

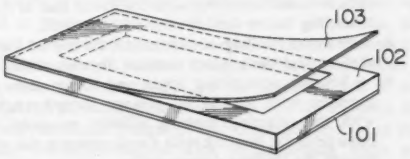
Noboru Hayama, Tokyo, and Yoshio Tsuji, Koganei, both of Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Mar. 12, 1976, Ser. No. 666,305

Claims priority, application Japan, Mar. 13, 1975, 50/30475; Apr. 16, 1975, 50/51306[U]; Apr. 24, 1975, 50/56261[U]; Apr. 24, 1975, 50/56262[U]

Int. Cl.[2] B41F *15/34*

U.S. Cl. 101—128.2 **4 Claims**



1. A stencil paper assembly comprising:

a stencil sheet, an ink-impermeable sheet and a frame sheet element interleaved between said stencil sheet and said ink-impermeable sheet;

said stencil sheet being connected to said frame sheet element at least at a part of peripheral portions thereof while said ink-impermeable sheet is connected to said frame sheet element only at a part of peripheral portions thereof;

said stencil sheet and said ink-impermeable sheet defining

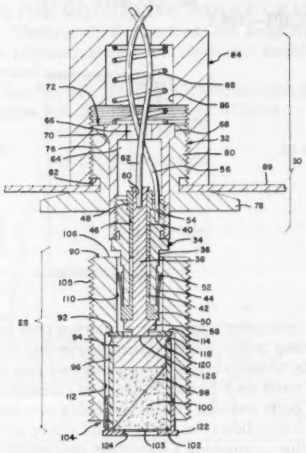
with interposition of said frame sheet element a space therebetween for retaining a relatively viscous liquid ink substance sandwiched by the stencil sheet and said ink-impermeable sheet without the use of a pad or other porous carrier.

4,128,058

IGNITOR ASSEMBLY

James L. Mixon, Jr., Harrisburg, and Walter M. Werner, Dowingtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 14, 1977, Ser. No. 806,570
Int. Cl.[2] F42C *19/12*
U.S. Cl. 102—28 R **2 Claims**



1. A firing assembly for igniting a propellant contained in a chamber of an explosively actuated cable connector having an opening to the chamber, which comprises:

a. an ignitor subassembly comprising a conductive tubular body member having a passage therethrough, an insulated housing positioned in the lower part of the passage, said housing containing a propellant therein, a heating wire extending through the propellant with a first end being electrically contactable in said passage and a second end being in electrical contact with the tubular body member, said housing further having a covered aperture in the base thereof with the covering being flammable, said ignitor subassembly being positionable in the opening with the aperture adjacent to the chamber;

b. a remote firing subassembly comprising:

i. a contact member having a conductive outer shell with a conductive center post positioned therein and electrically isolated therefrom with the lower end of the post extending below the lower end of the shell,

ii. a retaining bushing connected to the top of the outer shell so that the contact member depends therefrom,

iii. a housing comprising upper and lower units joined together with an aligned passage therethrough, and with the retaining bushing slidably mounted in the passage in the housing with a coil spring in the passage biasing the bushing downwardly,

c. belt means for holding the remote firing subassembly on the connector with the contact member in the passage of the tubular body member with the center post in electrical contact with the first end of the heating wire and the outer shell in electrical contact with the second end of the heating wire via the tubular body member; and

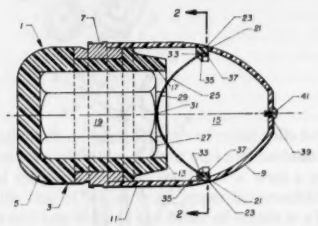
d. first and second electrical wires connectable at one end to a power source, the first wire being connected to the center post and the second wire being connected to the outer shell so that a current may flow through the heating wire from the first wire and to the second wire through the tubular body member whereby the heating wire becomes hot and ignites the propellant with the flames therefrom burning through the covering and igniting the propellant in the chamber.

4,128,059

COLOR-DISSEMINATING PROJECTILE FOR TRAINING CARTRIDGE

Walter L. Black, Baltimore County, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 20, 1977, Ser. No. 817,303
Int. Cl.[2] F42B *11/18*
U.S. Cl. 102—92.7 **5 Claims**



1. A color dissimainting projectile for a training cartridge, comprising:

a generally cylindrical base member having a prism-shaped axial recess of non-circular cross-section, closed at the rear end and open at the front end;

a prism-shaped heavy piston of similar non-circular cross-section slidably disposed in said recess;

a cup-shaped ogive member of frangible material, closed at one end and open at the other end, having its open end attached to the open end of said base member to form a cavity therebetween, said ogive member having an annular interior groove forming an annular weak region therein;

spring means resiliently interposed between said ogive member and the front end of said piston, for preventing forward movement of said piston prior to impact; and

a mass of finely-divided color-producing material substantially filling said cavity;

whereby, on target impact, said piston moves forward by inertia, engages said ogive member, breaks said weak region, and disseminates said material into the air, thus producing an easily-visible aerosol color signal in the region of impact.

4,128,060

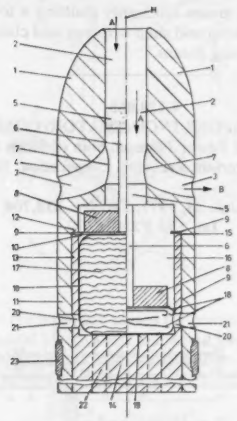
SHORT-RANGE PROJECTILE FOR PRACTICE AMMUNITION

Heinz Gawlick, Vagen Post Feldkirchen-Westerham, and Axel Homburg, Bensberg, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Apr. 7, 1977, Ser. No. 785,529
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616209
Int. Cl.[2] F42B *13/20*
U.S. Cl. 102—92.7 **24 Claims**

1. A short-range projectile for practice ammunition comprising axial air inlet duct means emanating from the front end of the projectile, at least one outlet duct means connecting the inlet duct means with the jacket of the projectile, at least one of the inlet and outlet duct means being blocked during the initial flight path of the projectile, and blocking means for blocking one of the inlet and outlet duct means, the blocking

means being displaceable within the projectile in a chronologically controlled manner in response to an air pressure head occurring during flight of the projectile from a starting position in the projectile for preventing the influx of air from the



inlet duct means to the outlet duct means to a final position in the projectile wherein communication and influx of air from the inlet duct means to the outlet duct means is completely enabled.

4,128,061

SAFETY SYSTEM FOR A PROJECTILE FUSE

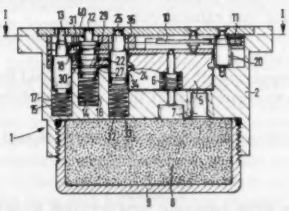
Hans Kaiser, Konigsfeld, Germany, assignor to Gebruder Junghans GmbH, Schramberg, Germany

Filed Sep. 8, 1977, Ser. No. 831,388

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643828

Int. Cl.[2] F42C 9/04

U.S. Cl. 102—249 **6 Claims**



1. A fuse for detonating a projectile, said fuse being of the type comprising a rotatable rotor; a detonator carried by said rotor, said rotor and detonator being rotatable to displace said detonator from a firing position; power storing means energized in response to such displacement of said detonator to urge said rotor and detonator back toward the firing position; restraining means for controlling the rate of return of said detonator to the firing position, said restraining means comprising an armature wheel connected to said rotor, and a swinging arm connected to said armature wheel for regulating the rotation of said armature wheel to regulate the rate of rotation of said rotor; a safety mechanism comprising first and second pins arranged parallel to one another, axially compressed power storing elements urging said pins to a safety position in which one of said pins prevents rotation of said restraining mechanism; said pins being axially displaceable in response to firing of said projectile to release said restraining mechanism; and a locking ball disposed between said pins for being shifted into axial alignment with said one pin by the other pin to prevent return of said one pin to a safety position; the improvement comprising:

an additional safety mechanism which functions independently of said first-named safety mechanism, said additional safety mechanism comprising:

a plurality of safety pins displaceable independently of one another in response to acceleration forces such that one safety pin tends to release said rotor for rotation and the other tends to restrain said rotor from until acceleration diminishes;

spring means for resisting such displacement of said safety pins; and

means connecting said additional safety mechanism and said first-named safety mechanism such that one of said safety mechanisms is actuable in response to acceleration forces to release said rotor only following displacement of the other of said safety mechanisms by the acceleration forces.

4,128,062

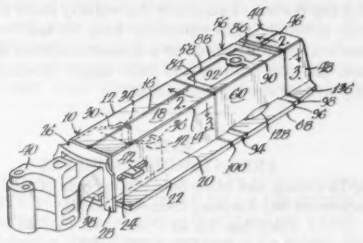
CENTER BRACE MEMBER

Leslie N. Roberts, Columbus, Ohio, assignor to Buckeye International, Inc., Columbus, Ohio

Continuation of Ser. No. 583,054, Jun. 2, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 757,453

Int. Cl.[2] B61F 1/02

U.S. Cl. 105—420 **2 Claims**



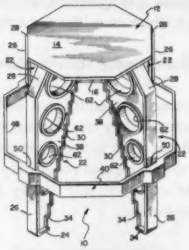
1. A unitary cast center sill portion to be welded between outboard and inboard center sill sections in longitudinal alignment therewith to form an elongated center sill for a railway car, at least one of said center sill sections being of the double-Z type having opposed horizontal side flanges at the lower end thereof, said unitary cast center sill portion comprising, in combination, a horizontal top wall, a pair of vertical side walls depending from said top wall, side flanges extending horizontally outwardly from the lower end of said side walls along the entire length of said center sill portion, a pair of rear draft lugs formed at the outboard end of said center sill portion, said outboard end, including said rear draft lugs, and the inboard end of said center sill portion, being of reduced dimensions so as to telescrope respectively into the adjacent ends of said outboard and inboard center sill sections with the top wall, side walls and horizontal flanges of said center sill portion in substantially coplanar relation with corresponding walls and flanges of at least one of said center sill sections, a king post cast integral with said center sill portion extending from the bottom wall to the top wall thereof so as to be reinforced by both said walls, said king post having a vertical hole formed therein which is of a reduced diameter adjacent the lower end of said king post and is of increased diameter for the remainder of the length of the post, and a recessed area formed in said top wall of said center sill portion intermediate the boundaries thereof for reducing the area required to be machined to render said top wall substantially coplanar with the top walls of said outboard and inboard center sill sections.

4,128,063

STOOL

Hillard M. Avery, R.R. 3, Box 140A, Morgantown, Ind. 46160

Filed Sep. 21, 1977, Ser. No. 835,059
Int. Cl.[2] A47B *7/00*
U.S. Cl. 108—91 **10 Claims**



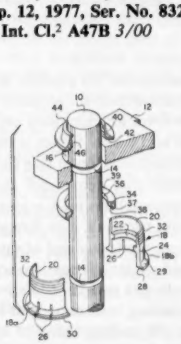
1. A supporting stand comprising a top providing an upwardly facing supporting surface and a downwardly facing surface providing a plurality of channels, and a plurality of legs, each leg having a top portion for engagement with a respective channel on the downwardly facing surface, the legs being readily disengageable from the top to render the stand collapsible, each leg further including a central web-like portion surrounded by a reinforcing flange portion providing said top portion, a supporting foot portion which is parallel with the leg top portion, a generally flat radially outer edge which extends generally perpendicularly from its said foot portion toward said leg top portion to a distance between the leg foot portion and top portion, and then tapers upwardly and inwardly toward the leg top portion.

4,128,064

FREE STANDING SHELVES

Ming-To Chung, and Ming-Sum Chung, both of Apt. #511, 670 Parliament St., Toronto, Ontario, Canada

Filed Sep. 12, 1977, Ser. No. 832,748
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—111 **15 Claims**



1. A shelf structure which comprises: a shelf including an opening;

a post extending freely through said opening and having a plurality of first abutment means mutually spaced apart and on said post; and a shelf-supporting and clamping means releasably engaged with said post and which in turn comprises:

a collar surrounding said post;

a second abutment means on said collar and engaging one of said plurality of first abutment means on said post whereby said collar is securely held in a fixed position relative to said post;

a fastening means removably encircling said collar so as to maintain said second abutment means and said one of said plurality of first abutment means in engagement with each other;

a shelf-supporting surface on said fastening means and in supporting juxtaposition with an undersurface of said shelf, and,

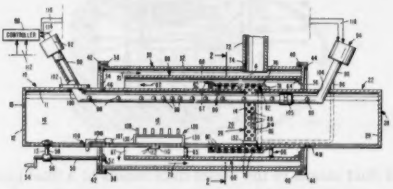
a shelf-clamping means releasably abutting a top surface of said shelf to clamp said shelf between said clamping means and said fastening means.

4,128,065

GENERAL PURPOSE INCINERATOR/COMBUSTOR

James F. Kelly, and Edwin Johnson, both of Silver Spring, Md., assignors to Materials Recovery Corporation, Silver Spring, Md.

Filed Jul. 25, 1977, Ser. No. 818,708
Int. Cl.[2] F23G *3/00*
U.S. Cl. 110—211 **17 Claims**



1. A multi-fuel incinerator, comprising:

an elongated combustion chamber having a generally horizontal axiz and having first and second ends, said combustion chamber defining a centrally located fire zone;

an ash chamber having a generally horizontal axis and first and second ends, said ash chamber being coaxial with said combustion chamber and axially spaced therefrom to define a circumferential exhaust outlet;

means for varying the spacing between said combustion chamber and said ash chamber to vary the size of said exhaust outlet;

an afterburner casing coaxial with and coextensive with at least the fire zone portion of said combustion chamber and surrounding said exhaust outlet;

baffle means within said afterburner and surrounding said exhaust outlet;

means for supplying air under pressure to said fire zone in a direction to create a vortex flow within said fire chamber; and

means for placing materials to be burned in said fire zone.

4,128,066

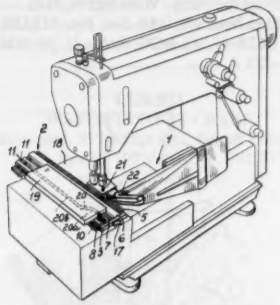
APPARATUS FOR SEWING TOGETHER PORTIONS OF KNITTED ARTICLES

Alessandro Peloggio, P.za dei Canonici Lateranensi, 12, Bergamo, Italy

Filed Nov. 5, 1976, Ser. No. 739,383
Claims priority, application Italy, Nov. 21, 1975, 29537 A/75; Sep. 14, 1976, 27185 A/76
Int. Cl.[2] D05B *7/00*
U.S. Cl. 112—27 **8 Claims**

1. An apparatus for sewing together portions of knitted fabric, comprising a sewing machine having a needle and means for advancing one of said knitted fabric portions to be sewn, at least one supporting member including a bed, means for moving said supporting member in a plane substantially perpendicular to said needle and said bed along a path aligned at least in proximity of said needle with the path whereabout said advancing means cause said one of said knitted fabric portions to advance, a plurality of impaling pins axially slidable within said bed in a direction substantially perpendicular to said needle between an unloading position whereat they are withdrawn within said bed and a loading position whereat they

project outwardly of said bed for the orderly application thereon of the loops of the other of said knitted fabric portions along the path of the line to be sewn with said one of said



knitted fabric portions, and means for controlling said impaling pins between said loading and unloading positions, effective to cause the withdrawal of said impaling pins within said bed as they pass in proximity of said needle.

4,128,067

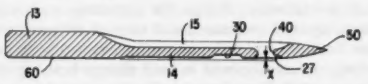
SEWING MACHINE NEEDLES

Josef Zocher, Aachen, Haaren, Fed. Rep. of Germany, assignor to The Singer Company, New York, N.Y.

Division of Ser. No. 705,859, Jul. 26, 1976. This application Apr. 4, 1977, Ser. No. 784,000

Int. Cl.[2] D05B *85/00*

U.S. Cl. 112—222 **2 Claims**



1. A sewing machine needle having a butt portion and a blade portion formed with a long groove extending from said butt portion to closely adjacent the free extremity of said blade portion, two lengthwise extending flanges formed on said blade portion, each of said flanges by means of a substantially flat inside surface thereon defining one side of said long groove, an eye formed from said long groove transversely through said blade portion adjacent the free extremity of said blade portion, a point formed on said blade portion free extremity, each of said flanges being formed with an outside surface substantially parallel to the flat inside surface thereof, said parallel surfaces of the two flanges at least adjacent to said eye diverging from said long groove at an angle at least 30°.

4,128,068

FLOATING-REFUSE-COLLECTING BOAT

Hajime Ogura; Haruma Asakawa; Junichi Kondoh, all of Yokohama; Masashi Nakamura, Isehara, and Sadamu Oyaide, Yokohama, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

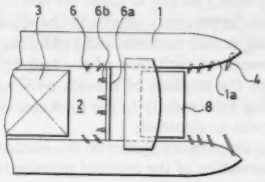
Filed Jul. 6, 1977, Ser. No. 813,251

Claims priority, application Japan, Jul. 10, 1976, 51-82310

Int. Cl.[2] B63B *35/32*

U.S. Cl. 114—26 **5 Claims**

1. A floating-refuse-collecting boat comprising a twin hull arranged to float in the water having a water level with a portion of said twin hull located above the water level and the remaining part below the water level and including a pair of hulls each having a fore end and an aft end with the fore ends and aft ends positioned opposite one another and with said hulls spaced laterally apart and forming therebetween a water channel extending from the fore ends to the aft ends of said twin hull, a floating-refuse collector having a fore end and an aft end, said collector located in said water channel between said pair of hulls, the fore end of said collector spaced from the fore ends of said hulls in the direction toward the aft ends thereof, said fore end of said collector being open for receiving floating refuse flowing into said water channel, a plurality of main water-jet units mounted on the fore ends of each of said hulls forwardly of the fore end of said collector and arranged to direct jets of water into said water channel generally rearwardly toward the fore end of said collector, said main water-jet units located on said hull both above and below the water level, a plurality of auxiliary water-jet units mounted on said twin hull and located rearwardly of said main water-jet units



and forwardly of the fore end of said collector and arranged to direct jets of water into said water channel toward the fore end of said collector for preventing refuse within said collector from flowing out of the fore end thereof when said boat moves astern, and a guide plate extending transversely between said pair of hulls across the water channel therebetween and below the water level of said hulls and said guide plate located rearwardly of said main water-jet units and forwardly of said auxiliary water-jet units, said guide plate arranged to aid said main water-jet units in inducing the flow of water with floating refuse into said water channel toward the fore end of said collector.

4,128,069

METHOD OF MOUNTING A HEAT-INSULATING COMPOSITE WALL STRUCTURE IN A LIQUEFIED GAS TRANSPORTATION AND/OR STORAGE TANK

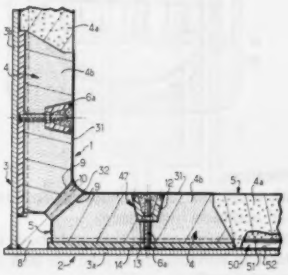
Michel Kotcharian, Paris, France, assignor to Technigaz, France

Filed Jul. 27, 1977, Ser. No. 819,599

Claims priority, application France, Aug. 10, 1976, 76 24415

Int. Cl.[2] B63B *25/08*

U.S. Cl. 114—74 A **12 Claims**



1. A method of mounting and assembling a wall structure comprising a rigid outer wall constituted by a ship's double hull forming a secondary barrier, a wall of heat-insulating material such as a rigid polyurethane foam injected directly onto the secondary barrier, and an inner, substantially flexible wall or sealing membrane forming a primary barrier secured on the said insulating wall, for a tank of, for example the built-in, integrated or incorporated type intended to contain, in particular liquefied petroleum gases, wherein it consists:

in securing for example welding, rows of fastening studs on

each internal face of the secondary barrier at predetermined spaced points thereof,

in laying between the said rows of studs strips or bands of a material such as glass cloth for improving the adherence of the secondary barrier,

in mounting a series of stiffening blocks or elements of a predetermined length in longitudinal relationship to the straight edge line of each dihedral angle of the tank near the ends of the two adjacent internal faces of the tank defining the said dihedral angle,

in fastening the said stiffening blocks or elements by means of the said studs and of, for example, a suitable material interposed between the stiffening blocks or elements and the secondary barrier to cause the said stiffening blocks or elements to correctly adhere to the secondary barrier,

in injecting within the frame defined by the stiffening blocks or elements at each face of the tank the insulating wall through the medium of moulds over a thickness corresponding substantially to the thickness of the said stiffening blocks or elements,

in placing the primary barrier on the insulating wall after the polymerization of the injected polyurethane foam,

in ensuring the continuity of the insulating wall between the two rows of stiffening blocks or elements at each dihedral angle by interposing shim elements therebetween, and

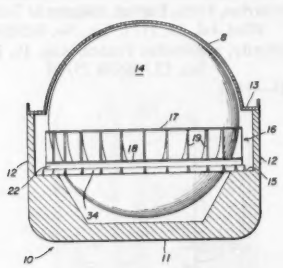
in applying at least in the region of the shim elements a curved joint-strap embracing each dihedral angle of the tank to ensure continuity between the primary barriers of the two tank faces defining the said dihedral angle.

4,128,070

SHIP TANKS WITH CONTINUOUS SUPPORT SYSTEM

Fahim E. Shadid, Downers Grove, and Paul R. Johnson, Oak Lawn, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Aug. 17, 1977, Ser. No. 825,281
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—74 A **24 Claims**



1. In combination:

a tank with a circular horizontal cross-section, which expands and contracts in service,

a tank support element on the tank and above the tank bottom extending horizontally around the tank and having a flat horizontal surface,

a support base on which the tank support element flat horizontal surface rests in radial slidable contact,

a horizontal collar member having a face circular in section,

a horizontal ring member having a face circular in section,

wherein one of the collar member and the ring member is joined to the tank and the other one of the collar member and the ring member is joined to the support base, and the collar member face is located around the ring face, and

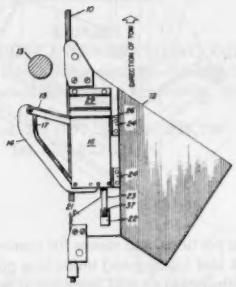
restraining means which prevents lateral movement of the tank when empty and at nonservice temperature.

4,128,071

UNDERWATER MINE CHAIN/CABLE CUTTER

Bobby C. Layman, and Lanny G. Burdge, both of Dahlgren, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1963, Ser. No. 327,150
Int. Cl.[2] B63B *43/00*; B63C *7/16, 11/50*; B26D *1/00*
U.S. Cl. 114—221 A **15 Claims**



1. In an improved paravane the combination comprising;

a body unit,

a charge housing,

means for slideably engaging said charge housing with said body unit,

a mooring line engaging means pivotally connected to and extending from said charge housing,

an explosive charge disposed in said charge housing,

a detonation means attached to said body unit and connected to said explosive charge for actuating said explosive charge upon a predetermined amount of relative movement between said charge housing and said body unit, and

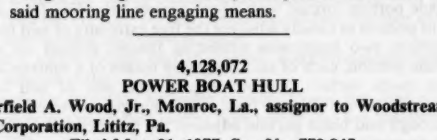
a locking means disposed in said charge housing between said mooring line engaging means and said detonation means for preventing relative movement between said charge housing and said body unit prior to movement of said mooring line engaging means.

4,128,072

POWER BOAT HULL

Garfield A. Wood, Jr., Monroe, La., assignor to Woodstream Corporation, Lititz, Pa.

Filed Mar. 21, 1977, Ser. No. 779,845
Int. Cl.[2] B63B *1/20*
U.S. Cl. 114—291 **5 Claims**



1. A power boat hull having sides and a bottom, said bottom being formed of a series of vertically stepped panels disposed symmetrically on either side of the hull center line, said series of panels on either side of the hull center line including an inboard panel and a center panel and an outboard panel, vertical risers joining the adjacent edges of said center and outboard panels, vertical risers joining the adjacent edges of said center and inboard panels and extending on opposite sides of the hull center line from the stern to a point of intersection on the center line adjacent the bow to provide soft riding qualities, said panels being angled upwardly from the horizontal out-

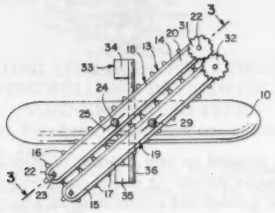
wardly of the hull center line with such angularities decreasing between successive panels in the outboard direction at all stations along the length of the hull except at the stern, the angularities of each said inboard and center panels increasing from the stern toward the bow while the angularities of said outboard panels remain constant thereby stabilizing the hull both while running at all speeds and at rest.

4,128,073

WATER SPORTS CRAFT

George L. Rossmann, 917 Ridge Rd., Island Lake, Ill. 60042

Filed Apr. 8, 1977, Ser. No. 785,747
Int. Cl.[2] B63H *16/00*
U.S. Cl. 115—22 5 Claims



1. A water sports craft comprising: a pair of laterally spaced elongated pontoons, steering means mounted on one of said pontoons, and inclined tread-mill propulsion means constructed and arranged in fixed position between said laterally spaced pontoons such that one end of said propulsion means extends above said pontoons and the opposite end of said propulsion means extends below said pontoons into the water when said craft is launched, said tread-mill propulsion means comprising two endless belts, a plurality of cleats arranged transversely on the outer surface of each belt, said cleats being equally spaced longitudinally thereof, and belt mounting frame members constructed and arranged to support said belts in superposed relationship whereby linear movement of one belt in one direction effects linear movement of the other belt in the opposite direction, said belt mounting frame members comprising spaced parallel side plates, transversely arranged roller shafts at opposite ends respectively of said side plates and belt supporting rollers on said shafts, the corresponding roller shafts of each superposed frame member being provided with a spur gear, said spur gears arranged to be in contact for providing positive drive between the superposed belts.

4,128,074

APPARATUS FOR COATING FOOD PRODUCTS

Jack J. Rejsa, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Mar. 15, 1977, Ser. No. 777,879
Int. Cl.[2] B05C *5/00, 11/11*
U.S. Cl. 118—24 3 Claims

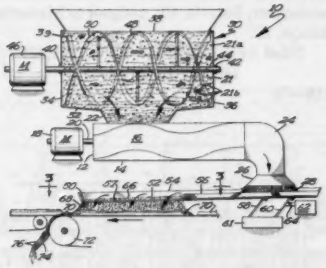
1. An apparatus for assembling composite food products by depositing a fluid food product dispersion comprising, macerated, ground, chopped, or an otherwise subdivided food product onto food bases, said apparatus comprising:

(a) a tank means for storing a supply of said dispersion, said tank including side and end walls;

(b) a metering means communicating with the bottom of the tank for withdrawing and expelling said dispersion from the tank at a controlled rate;

(c) a nozzle connected to the outlet of the metering means for dispensing said dispersion in a downward direction;

(d) a vibrating tray feeder means generally horizontally disposed above a food base and below said nozzle, said feeder means having an outlet edge over which said dispersion is allowed to fall as a uniform continuously descending curtain after passing across the surface thereof; said outlet edge being positioned above the food bases traveling beneath said feeder means and being of sufficient width to distribute said dispersion onto the upper surface of the food bases, vibratory support means for said feeder



means, motor means for imparting vibratory motion thereto; and

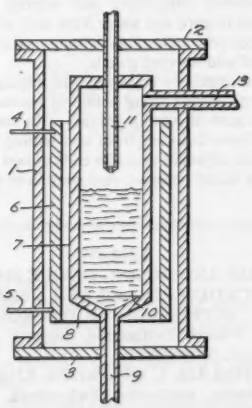
(e) a conveyor beneath said feeder means for conveying the food bases.

4,128,075

APPARATUS FOR COATING FUEL FERTILE OR ABSORBER MATERIAL CONTAINING PARTICLES FOR HIGH TEMPERATURE FUEL ELEMENTS

Hans Huschka, and Wolfgang Warzawa, both of Grossauheim, Germany, assignors to HOBEG Hochtemperaturreaktor-Brennelement G.m.b.H, Grossauheim, Germany

Division of Ser. No. 500,017, Aug. 23, 1974, Pat. No. 4,056,641.
This application Mar. 29, 1977, Ser. No. 782,509
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1973, 2343123
Int. Cl.[2] C23C *13/08;* G21C *3/14*
U.S. Cl. 118—49.1 5 Claims



1. An apparatus for coating particles of a member of the group consisting of fuel, fertile material and absorber materials comprising

a vertically positioned reaction tube, the bottom of which is cone-shaped, containing a fluidized bed of said particles,

an inlet means to said tube for carrier gas to maintain said bed in fluidized condition, said inlet being below said bed,

a gas outlet means from said reaction tube and above said bed,

at least one inlet supply means for coating gas terminating in a nozzle above said fluidized bed, and

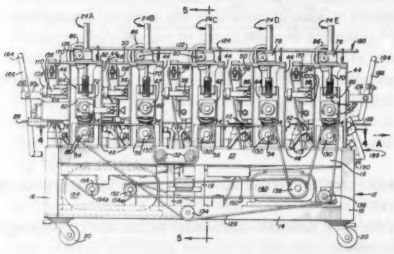
means for retracting said nozzle so that it remains above said bed as the bed expands during the coating.

4,128,076

APPARATUS FOR DECORATING EMBOSSED PANELS

Lyn R. Daunheimer, Batavia, Ill., assignor to Masonite Corporation, Chicago, Ill.

Filed Aug. 30, 1976, Ser. No. 719,069
Int. Cl.[2] B05C *11/02*
U.S. Cl. 118—70 **11 Claims**



1. Apparatus for removing liquid colorant from the surface of sheet material such as decorative panels and the like comprising:

a drive roll means underlying said panels for moving the same along a generally horizontal work path at a selected speed;

at least one driven wiping roll means supported on an axis above said work path having a cylindrical resilient wiping surface driven to wipingly engage an upper surface of said panels passing under said wiping roll means carried by said driven roll means;

said wiping roll means including motor means for driving said wiping surface to contact said upper surface of said moving panels at a speed at least 15% higher than said speed of said panels along said work path;

means resiliently supporting said wiping roll means for movement toward and away from said work path to provide selectively adjustable wiping pressure against said surface of said moving panels;

blade means angularly engaging said wiping surface of said wiping roll means along a line of contact spaced away from the area of wiping contact with said panels for removing liquid colorant from said wiping surface; and

trough means adjacent opposite ends of said blade means for receiving liquid colorant removed from said wiping surface.

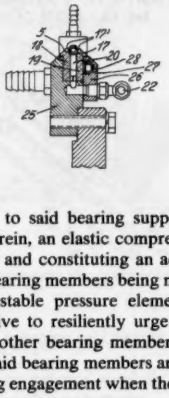
4,128,077

APPLICATION AND DOSING DEVICE HAVING A MINI APPLICATION ROLLER AND A SEALINGLY SUPPORTED DOCTOR ROD

Paul Meier, Winkel, Switzerland, assignor to Bachofen & Meier, Bulach, Switzerland

Filed Aug. 1, 1977, Ser. No. 821,001
Claims priority, application Switzerland, Aug. 5, 1976, 10044/76
Int. Cl.[2] B05C *11/02*
U.S. Cl. 118—104 **1 Claim**

1. In an application and dosing device for the distribution of a highly fluid medium onto a sheet of material, said device being of the kind including an application roller, and a doctor rod disposed adjacent to said application roller, the improvement wherein the application roller is in the form of a mini roller having a diameter less than 60 mm, the application roller having an axial channel therethrough for passage of cooling water, the doctor rod being supported for rotation in a bearing which partly embraces the lower side of said rod, said bearing comprising a bearing support which supports two spaced bearing members fabricated of a viscoelastic material, the doctor rod being sealingly engaged by and supported under resilient clamping pressure between said bearing members along substantially the entire length of said doctor rod, said bearing members having scraper edges adjacent their upper edges respectively in engagement with spaced portions of the lower side of said rotatable doctor rod, said bearing members having respective portions which extend in generally parallel relation to one another below said doctor rod to define the sides of a wash water channel immediately below the doctor



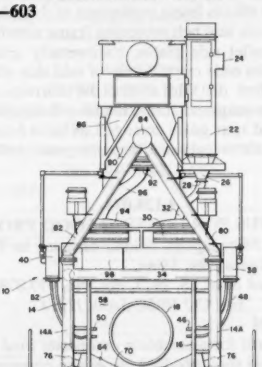
rod, a ledge secured to said bearing support and having a transverse groove therein, an elastic compressed air tube supported in said groove and constituting an adjustable pressure element, one of said bearing members being movable and being abutted by said adjustable pressure element, said pressure element being operative to resiliently urge said one bearing member towards the other bearing member so as to provide adjustment between said bearing members and said doctor rod to maintain said sealing engagement when the bearing becomes worn.

4,128,078

APPARATUS FOR APPLYING POWDERED COATING MATERIALS TO THE OUTER PERIPHERY OF OBJECTS

Woodrow W. Stoltz, and Charles R. Thatcher, both of P.O. Box 35103, Tulsa, Okla. 74135

Filed Jul. 15, 1977, Ser. No. 815,905
Int. Cl.[2] B05C *19/00*
U.S. Cl. 118—603 **6 Claims**



1. Apparatus for applying powdered coating materials to the outer periphery of objects and comprising main framework means having an internal spraying chamber for receiving the object therethrough, gun battery means carried by said framework means and arranged for directing a spray pattern in a direction toward the object within the spraying chamber, new powder reservoir means carried by said framework means for receiving a supply of new powdered coating material therein, fluidizing means in communication with the new powder reser-

voir means for receiving the new powder therefrom, means operably connecting said fluidizing means with said gun battery means for directing the fluidized powder to the gun battery means for spraying thereof onto the outer periphery of the object, filtered overspray capturing chamber means carried by said framework means for retrieving powder overspray during a spraying operation, reclaimed powder reservoir means in communication with said overspray capturing chamber means for receiving the reclaimed powder therefrom, second fluidizing means in communication with said reclaimed powder reservoir for receiving the reclaimed powder therefrom, said second fluidizing means being in communication with the first-mentioned fluidizing means for directing the reclaimed powder therefor for application of the reclaimed powder to the outer periphery of the object.

4,128,079

MOUNTING APPARATUS FOR A DRUM AND DEVELOPING ROLL IN A DEVELOPING UNIT OF MAGNETIC BRUSH TYPE

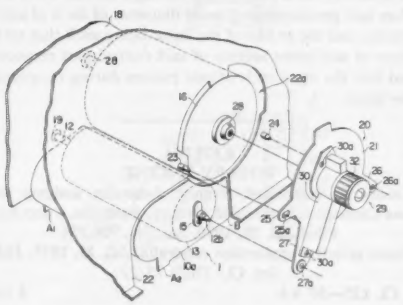
Minoru Suzuki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 15, 1977, Ser. No. 824,294

Claims priority, application Japan, Aug. 18, 1976, 51-110426; Oct. 20, 1976, 51-125907

Int. Cl.[2] G03G *15/09*

U.S. Cl. 118—658 **15 Claims**



1. A developing unit of magnetic brush type comprising:

a casing means for holding developer;

a magnet disposed in said casing means;

means, disposed in parallel relationship with said casing means, for defining a first central axis of rotation of a photosensitive member in the form of a drum, said defining means comprising two ends extending from the opposite sides of said drum;

a rotatable sleeve means for surrounding the magnet;

means for mounting said magnet and sleeve means on a second central axis of rotation of a magnetic brush to be formed on the sleeve means, said mounting means being supported on the casing means and having opposite ends projecting out of the casing means;

a fixed, first positioning means, detachably receiving one of said two ends of said defining means and one of said opposite ends of said mounting means in respective support apertures therein, for supporting said one end at a predetermined distance from each other;

a stationary member; and

a second positioning means, detachably fitted on the other of said two ends of said defining means and having a support aperture detachably receiving the other of said opposite ends of said mounting means on the second central axis of rotation associated with the magnetic brush, for supporting said other ends at said predetermined distance from each other on said stationary member.

4,128,080

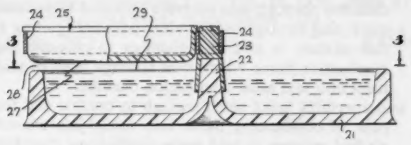
ANIMAL FEEDER

C. Rex Haney, 14160 Sayre St., Sylmar, Calif. 91342

Filed Apr. 6, 1977, Ser. No. 785,056

Int. Cl.[2] A01K *5/00*

U.S. Cl. 119—51.5 **2 Claims**



1. An improved animal feeder comprising a rectangular water dish, said water dish having a base with a non-circular post extending upwardly from said base near the center of said water dish, a rectangular bracket which attaches to, and is supported on, said post, said rectangular bracket extending to one side only of said post, and a rectangular food dish which rests on said bracket to one side of said post such that the bottom of said food dish is supported a short distance above the top rim of said water dish.

4,128,081

TORCH IGNITION TYPE INTERNAL COMBUSTION ENGINE

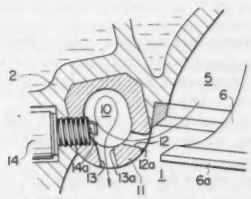
Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation-in-part of Ser. No. 610,889, Sep. 5, 1975, which is a continuation-in-part of Ser. No. 434,216, Jan. 17, 1974, Pat. No. 3,974,818. This application Dec. 28, 1976, Ser. No. 754,961

Claims priority, application Japan, Mar. 29, 1976, 51-34888

Int. Cl.[2] F02B *19/10, 19/16*

U.S. Cl. 123—32 SP **47 Claims**



1. A torch ignition type internal combustion engine comprising:

a cylinder;

a piston in said cylinder;

a cylinder head cooperating with said cylinder and said piston to define a main combustion chamber;

an intake port in said cylinder head;

an intake valve having a valve stem and a valve head connected thereto;

means for supplying said main combustion chamber with an air-fuel mixture through said intake port;

a trap chamber disposed in said cylinder head and having at least two apertures which are always in communication with said main combustion chamber during the time when said intake valve is kept closed and which are positioned such that a portion of said air-fuel mixture is introduced into said trap chamber through one of said apertures and residual gases remaining in said trap chamber are discharged through the other of said apertures into said main combustion chamber when said intake valve is opened and such that a part of the air-fuel mixture supplied into said main combustion chamber is introduced into said trap

chamber through both of said apertures on a compression stroke;

said trap chamber having a substantially smoothly continuous inner surface to which at least one of said apertures is substantially tangential to thereby cause a vortex flow of the air-fuel mixture in said trap chamber when said air-fuel mixture part is introduced from said main combustion chamber through said aperture into said trap chamber;

a spark plug having a set of electrodes for igniting the air-fuel mixture in said trap chamber to produce therein a combustion flame which runs through both of said apertures into said main combustion chamber;

said apertures being small enough to confine and form the runs of combustion flame into torch jets whereby the air-fuel mixture in said main combustion chamber is ignited.

4,128,082

ELECTRONIC FUEL INJECTION CONTROL DEVICE

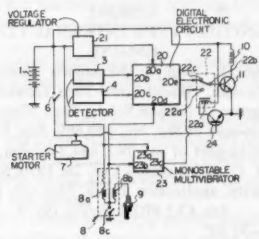
Keiji Aoki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Aichi, Japan

Filed Sep. 21, 1977, Ser. No. 835,167

Claims priority, application Japan, Mar. 18, 1977, 52-31976[U]

Int. Cl.[2] F02P *3/02*

U.S. Cl. 123—32 EA **6 Claims**



1. An electronic fuel injection control device of an internal combustion engine having fuel injection valves disposed upstream of intake valves of said engine and driving means of said injection valves, comprising:

a means for detecting a condition of said engine and for generating an electrical signal being indicative of said condition;

an electronic circuit for calculating a fuel injection period of said injection valves in accordance with said electrical signal, and for supplying a control signal based on said calculated fuel injection periods to each said driving means;

a means for generating a control signal having a predetermined pulse width, said generating means consisting of a C-MOS type element, and;

a switching means for feeding said driving means of said injection valves with said control signal provided from said generating means, when said engine is being started.

4,128,083

GAS CUSHIONED FREE PISTON TYPE ENGINE

Rudolf Bock, Palmerstrasse 9, 7031 Holzgerlingen, Fed. Rep. of Germany

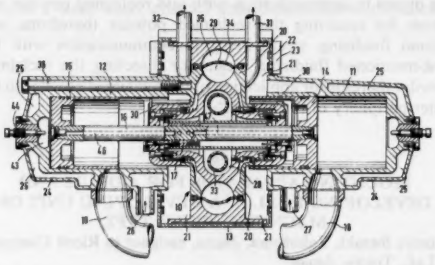
Filed Jun. 24, 1977, Ser. No. 809,999

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1976, 2630004

Int. Cl.[2] F02B *71/00*

U.S. Cl. 123—46 R **16 Claims**

1. In a gas cushioned free piston type engine, a combination comprising a pair of oppositely arranged combustion cylinders axially spaced from each other; a central engine part having an inner section projecting with opposite end portions respectively into said combustion cylinders radially inwardly spaced therefrom and an outer section; piston means comprising a pair of pistons respectively arranged in said combustion cylinders; common piston rod means rigidly connecting said pair of pistons of said piston means, said pistons having open ends of predetermined inner diameters facing each other; pump piston means having opposite faces impingeable by fluid and being fixedly mounted on said piston rod means, one of said means being eccentrically arranged with respect to the other of said



means; a pump cylinder in which said pump piston means is reciprocable, said pump cylinder being arranged in said inner section of said central part, said opposite end portions of said inner sections of said central part having a smaller outer diameter than said predetermined inner diameter of each of said pair of pistons, and the stroke of the latter being such that said end portions of said inner section of said central part respectively extend into the open ends of said pistons during reciprocation of the latter.

4,128,084

ROTARY ENGINE

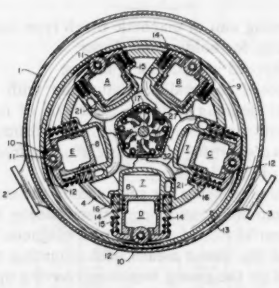
Alexander R. Sutherland, Sydney, Australia, assignor to Iris Jean Carrington Sutherland, Sydney, Australia, a part interest

Filed Jul. 20, 1976, Ser. No. 706,954

Claims priority, application Australia, Jul. 25, 1975, 2520/75

Int. Cl.[2] F02B *75/22*

U.S. Cl. 123—55 AA **4 Claims**



1. An internal combustion engine comprising a stator, a shaft rotatably mounted in and supported by the stator, a plurality of cylinders mounted on the stator with their axes radially arranged relative to the shaft axis and angularly spaced around the shaft axis, a piston reciprocately mounted in each cylinder, an orbitor fixed to the shaft, a gear fixed to the shaft, a toothed bore in the stator larger in diameter than said gear, a track on the stator concentric with the toothed bore, a roller mounted on the orbitor with the axis of rotation of the roller eccentric to but parallel with the shaft axis and with the roller engaging said track to maintain meshing engagement between some teeth of the gear and some teeth of said toothed bore, a follower on each piston, curved support surface means on the

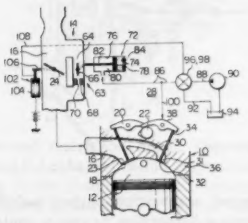
orbitor concentric with the shaft axis and resilient means to urge the followers into contact with said support surface means.

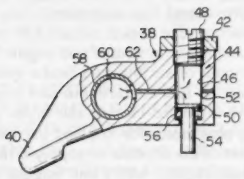
4,128,085

ENGINE MECHANICAL LOSS REDUCING SYSTEM

Kazuya Kunii, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 16, 1977, Ser. No. 797,139
Claims priority, application Japan, May 17, 1976, 51/56217
Int. Cl.[2] F02B *75/06*; F04L *1/18*
U.S. Cl. 123—75 E **6 Claims**





1. A mechanical loss reducing system of an internal combustion engine including

a combustion chamber,

a main intake passageway providing communication between the atmosphere and the combustion chamber through an intake port,

a main intake valve for opening and closing the intake port, and

output control means for controlling the output of the engine, said mechanical loss reducing system comprising

flow increasing means for increasing the flow of air passing through the main intake passageway during low load operations of the engine for feeding an excessive air-fuel mixture to the combustion chamber,

an auxiliary intake passageway branching off from the main intake passageway and opening into the combustion chamber,

an auxiliary intake valve for opening and closing said auxiliary intake passageway,

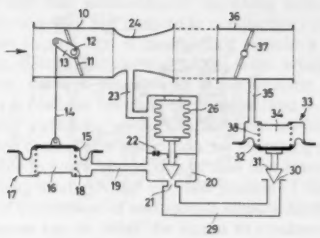
operating means for causing said auxiliary intake valve to open said auxiliary intake passageway at the intake stroke during the engine low load operations for causing said excessive air-fuel mixture to be drawn into the combustion chamber and for causing said auxiliary intake valve to close said auxiliary intake passageway later than the main intake valve at the compression stroke during the engine low load operations for expelling said drawn excessive air-fuel mixture from the combustion chamber.

4,128,086

AUTOMATIC DEVICE FOR CONTROLLING THE PRESSURE OF THE INTAKE AIR OF AN I.C. ENGINE AS ITS OPERATING ALTITUDE VARIES

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Feb. 10, 1977, Ser. No. 767,446
Claims priority, application Italy, Feb. 10, 1976, 20045 A/76
Int. Cl.[2] F02B *75/02*; F02M *1/10*
U.S. Cl. 123—75 D **8 Claims**



1. An I.C. engine particularly for motor vehicles, provided with carburetion means for forming the in-drawn air and fuel mixture, provided with means for adjusting the mixture flow under different conditions of engine use and also provided with an automatic device for controlling the pressure of the air drawn in as the engine operating altitude varies, said device comprising first valve means adapted to induce in the air flow reaching the engine carburetion means a fall in pressure variable between a maximum value at zero altitude and a minimum value at a predetermined altitude so as to keep the pressure downstream of said valve means substantially constant and equal to the external pressure corresponding to said predetermined altitude independently of the altitude of operation of the engine, and also comprising first actuator means which control said first valve means and are operated by an operating pressure which, as the altitude of operation of the engine increases, assumes intermediate values between the external atmospheric pressure and the pressure existing downstream of said first valve means, at said predetermined altitude the operating pressure assuming a value equal to the substantially constant value existing downstream of said first valve means, and the device also comprising second valve means controlled by second actuator means sensitive to an absolute pressure which is a function of the external atmospheric pressure, said valve means controlled by said second actuator means modulating the operating pressure reaching said first actuator means.

4,128,087

THROTTLE VALVE OPERATING MECHANISM

Makio Hayashi, and Takashi Hisatomi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 28, 1977, Ser. No. 810,792
Claims priority, application Japan, Jun. 30, 1976, 51-85929[U]
Int. Cl.[2] F02D *11/08*
U.S. Cl. 123—103 E **10 Claims**

1. A throttle valve operating mechanism for a carburetor having an intake passage containing therein a throttle valve which is biased to close said passage, said mechanism comprising:

a casing having therein a partition wall;

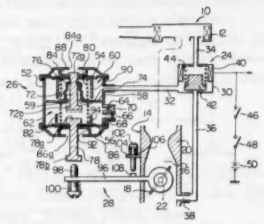
first and second movable walls covering respective open ends of said casing so as to define in said casing first and second chambers, said second chamber communicating through a flow restrictor with the atmosphere;

first and second biasing means respectively disposed in said first and second chambers for biasing said first and second movable walls in directions to separate from each other;

position setting means for setting the extreme position of said second movable wall in response to the movement of said

first movable wall, the expansion of said first chamber inducing a first extreme position of said second movable wall and the contraction of said first chamber inducing a second extreme position of said second movable wall;

transmitting means for controlling the throttle valve in such a manner that said throttle valve is nearly fully closed when said second movable wall takes said first extreme position, and said throttle valve is opened by a predetermined amount from said nearly closed position when said



second movable wall takes said second extreme position; and

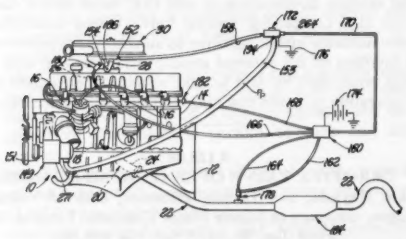
switching means for providing a fluid communication between said first chamber and the atmosphere to achieve the expansion of said first chamber when an engine driven power consuming device stops to run, and a fluid communication between said first chamber and a vacuum source to achieve the contraction of said first chamber when said engine driven power consuming device begins to run.

4,128,088

APPARATUS AND SYSTEM FOR CONTROLLING THE AIR-FUEL RATIO SUPPLIED TO A COMBUSTION CARBURETOR

Ronald E. Herman, Romeo, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed May 10, 1976, Ser. No. 684,548
Int. Cl.² F02M *11/00*
U.S. Cl. 123—119 EC **24 Claims**



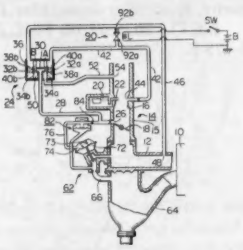
1. A carburetor for a combustion engine, comprising induction passage means for supplying motive fluid to said engine, a source of fuel, main fuel metering system means communicating generally between said source of fuel and said induction passage means, idle fuel metering system means communicating generally between said source of fuel and said induction passage means, selectively controlled pressure responsive modulating valving means effective to controllably increase or decrease the rate of metered fuel flow through each of said main fuel metering system means and said idle fuel metering system means, said modulating valve means being constructed so as to be effective to so alter said rate of metered fuel flow in response to a single control signal means generated as a consequence of selected indicia of engine operation, and pressure passage means effective for communicating with a source of superatmospheric fluid pressure for supplying a superatmospheric working pressure to said modulating valving means.

4,128,089

EXHAUST GAS RECIRCULATION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Masatami Takimoto; Mitsuyoshi Teramura, and Masahiro Urushidani, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 25, 1977, Ser. No. 781,426
Claims priority, application Japan, Jan. 6, 1977, 52-524
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **2 Claims**



1. In an internal combustion engine including an intake system comprising a carburetor having a venturi portion, an exhaust system and a vacuum operated valve for controlling flow of exhaust gas from said exhaust system to said intake system, the improvement that comprises:

an air introducing pipe means which has one end thereof opened to said intake system of said engine for introducing an extra amount of air into said intake system in order to supply a lean air-fuel mixture into said engine;

an air control valve for closing the other end of said air introducing pipe means for stopping the introduction of an extra amount of air in order to supply a rich air-fuel mixture into said engine, when said engine is in a running condition that both the vacuum level in the venturi portion of the carburetor and the vacuum level in said intake system are lower than respective predetermined values thereof, and;

a vacuum signal passageway means adapted for communicating said air introducing pipe means with said vacuum operated flow control valve, so that a vacuum signal from said air introducing pipe means is received by said flow control valve when said air introducing pipe means is closed for supplying a rich air-fuel mixture into said engine.

4,128,090

EXHAUST GAS RECIRCULATION SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

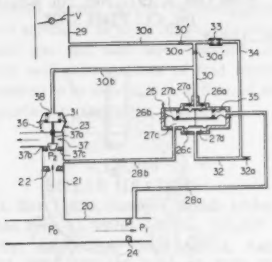
Filed Jun. 21, 1977, Ser. No. 808,554
Claims priority, application Japan, Jun. 23, 1976, 51-74168
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**

1. An EGR system for an internal combustion engine having an induction manifold and an exhaust conduit comprising:

means defining an EGR passage fluidly interconnecting the induction manifold and the exhaust conduit for recirculating a portion of the exhaust gases emitted from the engine into the exhaust conduit into the induction manifold for introduction into the combustion chamber;

EGR control valve means operatively disposed in the EGR passage for controlling the amount of exhaust gas passing therethrough in response to a vacuum signal fed to said EGR control valve means from the induction manifold;

pressure regulating means fluidly communicating with the atmosphere, the EGR passage and the exhaust conduit for receiving respectively therefrom atmospheric air, first pressure signal and a second pressure signal and also communicating said EGR control valve means in such a manner as to modulate, via the introduction of atmospheric air, the vacuum signal fed from the induction manifold to the EGR control valve means, in response to the pressure differential between said first and second pressure signals; and



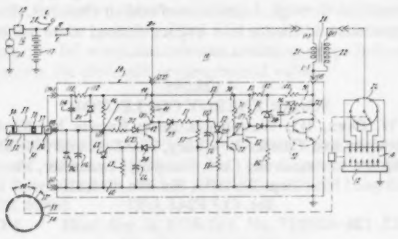
first and second restriction means disposed in the EGR passage and the exhaust conduit respectively, the pressure prevailing in the chamber defined between said first restriction means and the EGR control valve neans functioning as the source of said first pressure signal and the pressure prevailing in the region immediately downstream of the said second restriction means functioning as the source of said second pressure signal.

4,128,091

HALL EFFECT ELECTRONIC IGNITION CONTROLLER WITH PROGRAMMED DWELL AND AUTOMATIC SHUT-DOWN TIMER CIRCUITS

Isadore Balan, Oak Park, and Joseph J. Kopera, Trenton, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 18, 1976, Ser. No. 742,824
Int. Cl.[2] F02P *3/04*
U.S. Cl. 123—148 E **24 Claims**



1. In a breakerless electronic ignition system including a triggerable electronic ignition controller for an internal combustion engine having a source of low tension electrical energy, at least one sparking device and an ignition coil having a primary winding connected for energization from said source and another winding for supplying high tension energy to said sparking device, said controller adapted to be triggered from an engine-driven pickup device developing substantially rectangular-shaped electrical signal pulses of a pulse repetition rate proportional to engine speed and a fixed duty cycle or ratio of ON to ON and OFF period,

said controller comprising a first controllable semiconductor switching means adapted to be connected in series with the primary winding of the ignition coil directly across the source to receive the full voltage of said source across the said coil primary winding without any external current limitation upon conduction of said first controllable semiconductor switching means,

second controllable semiconductor switching means adapted to receive trigger signal pulses from said pickup device to change its state of conduction from one state to its other state directly in accordance with the ON period and OFF period of said signal pulses, said second semiconductor switching means being in one state of conduction when said first semiconductor switching means is in its conduction state and coupled in conductivity controlling relation to said first semiconductor switching means to change the conduction state of the latter when the conduction state of the second semiconductor switching means is changed by said trigger signal, and

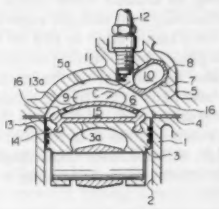
time delay switching means coupled between said second and first controllable semiconductor switching means and operable to block conduction of said first semiconductor switching means during an initial portion of the said one state of conduction of said second semiconductor switching means and to delay the return to conduction of the first controllable semiconductor switching means from the return of said second controllable semiconductor switching means to its said one state for a controlled delay period which is a function of engine speed and prevents dissipation of energy in the coil at low engine speeds without impairment to the dwell period of the controller at high engine speeds, said time delay switching means including a timing capacitor connected to be charged from said energy source in a circuit in parallel with the energization circuit of the ignition coil primary winding and serially-connected first controllable semiconductor switching means.

4,128,092

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Masato Yokota, and Hideo Kobayashi, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 18, 1977, Ser. No. 788,425
Claims priority, application Japan, Nov. 15, 1976, 51-136242
Int. Cl.[2] F02B *23/00, 19/10*
U.S. Cl. 123—191 S **15 Claims**



1. An internal combustion engine comprising:

a cylinder block;

a cylinder head fixed onto said cylinder block and having an inner surface;

a piston reciprocally movable in said cylinder block and having a top surface, said inner surface and said top surface forming a wall defining a main combustion chamber;

means for feeding a combustible mixture into said main combustion chamber;

means for discharging the exhaust gas from said main combustion chamber into the atmosphere;

a bore formed in said cylinder head defining a first auxiliary combustion chamber having a first connecting passage of a cross-sectional area which is smaller than that of said first auxiliary combustion chamber, said first connecting

passage defining a path of flow from said auxiliary combustion chamber solely to said main combustion chamber;

a single spark plug located in said bore;

a second auxiliary combustion chamber formed in said wall defining said main combustion chamber having a second connecting passage of a cross-sectional area which is smaller than that of said second auxiliary combustion chamber and which opens on said inner wall at a position remote from the path of flow of said first connecting passage so that a burning jet injected from said first connecting passage does not directly impinge upon said second connecting passage, said second auxiliary combustion chamber being connected via said second connecting passage solely to said main combustion chamber;

said first and second auxiliary combustion chambers being mutually isolated except through said main combustion chamber.

4,128,093

DRESSING DEVICES FOR PROFILING GRINDING WHEELS FOR THE FORM GRINDING OF INVOLUTE GEARS

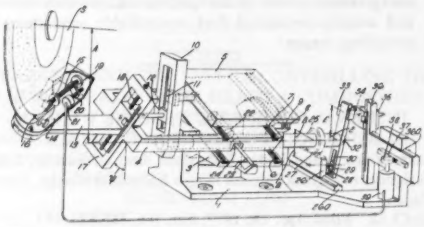
Paul F. Aschwanden, and Milan Bartosek, both of Zürich, Switzerland, assignors to Maag Gear-Wheel & Machine Co. Ltd., Zürich, Switzerland

Filed Aug. 16, 1976, Ser. No. 714,965

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1975, 2536895

Int. Cl.[2] B24B *53/08*

U.S. Cl. 125—11 T **8 Claims**



1. Dressing device for profiling grinding wheels for the form grinding of helically toothed involute cylindrical gears, the device comprising an arcuate roller guide, a rolling straight edge, means connecting said straight edge to the roller guide for restraining the straight edge to roll on the roller guide, a tool-holder slide guideway, mounting means for said guideway permitting angular adjustment of the guideway thereon according to the base helix angle of the toothing to be ground, means connecting said mounting means to the straight edge for imparting an involute motion thereto from the movements of said straight edge, a tool-holder slide, displaceable along the tool holder slide guideway and carrying a tipped or pointed dressing tool,

a pivot member constrained to be displaced with said rolling of the straight edge so as to participate in the pivotal movement of the straight edge about the axis of the roller guide but not in its rectilinear rolling movement component, a first crank slide, means locating said first slide for reciprocating movement and means for causing said first slide movements in dependence upon the pivotal movements of the pivot member, a crank, a fixed pivot mounting for said crank and a first slider connecting the crank to said first crank slide for movement of the crank by said first crank slide, a second crank slide, means guiding said second slide for movement parallel to the first crank slide and a second slider connecting the crank to said second crank slide for movement of said second slide by the crank, means connecting said second crank slide to the tool-holder slide for said displacement of the tool-holder slide along its guideway in dependence upon the movement of said second slide, the arrangement being such that said displacement of the tool-holder slide modifies said involute motion for profiling a grinding wheel for the form grinding of a helically toothed involute cylindrical gear.

4,128,094

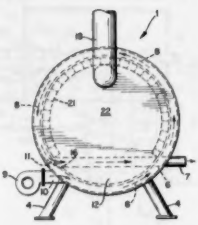
HEATER

Oscar D. Lewis, 1963 19th Ave. Ct., NW., Hickory, N.C. 28601

Filed Oct. 5, 1977, Ser. No. 839,754

Int. Cl.[2] F24H *3/08*

U.S. Cl. 126—110 B **3 Claims**



1. A hot air heater comprising: first and second enclosures, said first enclosure having a set of holes and said second enclosure having a first and second set of holes, the first set being aligned with and located opposite from said second set, said first enclosure completely surrounding and spaced apart from said second enclosure forming an air chamber therebetween, the enclosures being positioned relative to one another so that the holes of said first enclosure are in alignment with at least one set of holes of said second enclosure; a plurality of conduits disposed in said enclosures, positioned in a spaced apart relationship one to another in a common plane and received in said holes so that terminal portions of one end of said conduits bridge said air chamber and are in open communication with the outside air and their opposite ends are in communication with said air chamber; baffle means disposed in said air chamber for diverting air moving in said chamber into said conduits; and, a blower means in communication with said air chamber for circulating air from outside of the heater through the bottom portion of said air chamber, across the bridging portions of said conduits, through the balance of said air chamber, through said conduits and thence into a space desired to be heated.

4,128,095

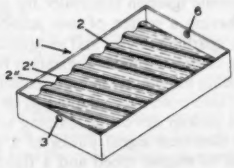
SOLAR ENERGY COLLECTOR

Jess W. Oren, III, Washington Boro; Eugene M. Kirchner, Maytown, and Charles F. Wehry, Jr., Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Sep. 19, 1977, Ser. No. 834,320

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **1 Claim**



1. A solar energy collector comprising:

(a) an outer member substantially transparent to solar energy rays;

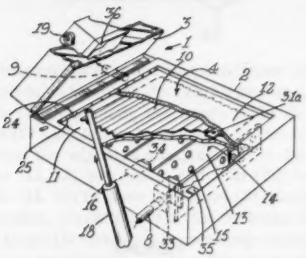
(b) a corrugated, thermally conductive absorbent transformer means spaced from said outer member;
(c) a longitudinal fluid space having an inlet aperture and an outlet aperture disposed between said transformer means and said outer member;
(d) a gas within said longitudinal fluid space wherein said absorbent transformer means heats said gas;
(e) means for directing said gas from said inlet aperture to said outlet aperture through said longitudinal fluid space; and
(f) said absorbent means having its corrugations so constructed and arranged as to be diagonally disposed to the flow of said gas and said outer member means being spaced from said corrugations of said absorbent transformer means so as to induce helical flow of said gas from the inlet aperture to the outlet aperture.

4,128,096

SOLAR HEATERS

Solly Katz, P.O. Box 78036, Sandton, South Africa (2146)

Filed Aug. 12, 1976, Ser. No. 713,827
Claims priority, application South Africa, Aug. 13, 1975, 75/5220; Oct. 13, 1975, 75/6445; Mar. 12, 1976, 76/1562
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **40 Claims**



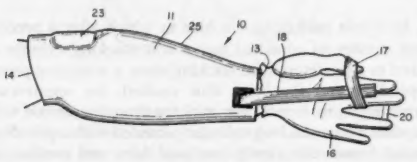
1. A solar heater adapted to receive water under pressure from a source outside the heater, the heater including a celestial radiation receiving collector, receiving said water; an insulating lid for covering the collector when the celestial radiation decreases below a predetermined value; and a water pressure responsive means including a piston being operated by water under pressure from said source for closing and opening the lid when the celestial radiation drops below and rises above the aforesaid predetermined value.

4,128,097

COMPRESSION DEVICE FOR TENNIS ELBOW

Michael C. Bilinsky, 515 Kelton Ave., Los Angeles, Calif. 90024, and Robert L. Gold, 5967 E. Pacific Coast Hwy., Long Beach, Calif. 90803

Filed Aug. 4, 1976, Ser. No. 711,566
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—165 **2 Claims**



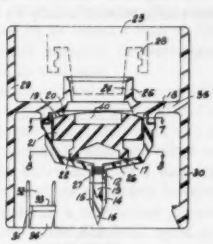
1. A compression device for compressing the common extensor muscle group of an individual so that he may exercise this muscle group of an individual so that he may exercise this muscle group in order to prevent the occurrence of tennis elbow, said compression device comprising:
a. An elastic member formed out of an elastic material and having a tubular shape adapted to provide a compressive force on the group of muscles and tendons of the individual, said elastic member having an inner surface and an outer surface; and
b. a non-compressible member formed out of a non-rigid material and disposed on said inner surface of said elastic member, said non-compressible member being adapted to cover the group of muscles and tendons to be protected;
c. a non-compressible pad formed out of a non-rigid material and disposed on said inner surface of said elastic member so that it covers the attachment area of the common extensor muscle group;
d. a glove having compartments for a thumb and four fingers, with said compartments for the thumb and first two fingers being fastened together; and
e. means for anchoring the thumb and first two fingers so that they cannot move, mechanically coupled to said glove and to said outer surface of said elastic member.

4,128,098

VALVED SPIKE TRANSFER DEVICE

William G. Bloom, Los Angeles; Pradip V. Choksi, Northridge, and Walter Seemayer, Burbank, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 6, 1976, Ser. No. 747,416
Int. Cl.[2] A61J *1/00*
U.S. Cl. 128—272.3 **18 Claims**



17. A valved spike transfer device comprising: a forwardly extending rigid tubular spike; and a nozzle coupler rigidly connected to the spike, said nozzle coupler including a valve that has a tubular rearwardly projecting nozzle receiver and a movable sealing means that opens upon insertion of a blunt tubular nozzle into the coupler and closes upon removal of such nozzle from the coupler; a protector skirt projecting rearwardly beyond the tubular nozzle receiver and spaced radially outward therefrom to define an annular recess of a size to receive a collar approximately the size of a conventional threaded syringe collar, which collar surrounds the nozzle, said tubular nozzle receiver having a wall sufficiently thin to be received between such nozzle and surrounding skirt; and a vial coupling means permanently joined at a fixed location to a unit formed by the nozzle coupler and spike.

4,128,099

SINGLE-POLE COAGULATION FORCEPS

Siegfried Bauer, Heidelsheim, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

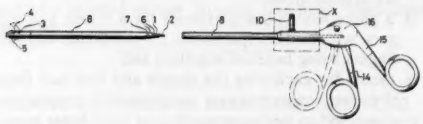
Filed Sep. 20, 1977, Ser. No. 835,011
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642489
Int. Cl.[2] A61N *3/04*
U.S. Cl. 128—303.17 **6 Claims**

1. A single-pole coagulation forceps instrument for endoscopy, said forceps comprising
(a) a traction rod having jaw means at one end, and said rod

comprising two spaced apart axially aligned parts which are insulatingly interconnected by an insulating body, said jaw means being connected to one of said parts;

(b) an electrically conductive, externally insulated guide barrel through which said traction rod passes and which includes a connection element connectable to a HF terminal, said jaw means being adjacent one end of said barrel;

(c) handle means connected to the other of said rod parts for moving said traction rod axially in said barrel for opening and closing said jaw means;



(d) means electrically connecting said jaw means to said barrel;

(e) an insulating sleeve secured to the other end of said barrel and having a greater cross-section than that of said barrel, and

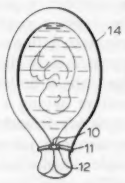
(f) said insulating sleeve defining a cavity which is spaced from said other end of said barrel and in which said insulating body is disposed and is axially displaceable when said traction rod is moved axially by said handle means.

4,128,100

SUTURE

Erwin R. Wendorff, 1303 Garden La., Reading, Pa. 19611

Filed Oct. 8, 1976, Ser. No. 730,798
Int. Cl.[2] A61L *17/00*; A61B *17/04*
U.S. Cl. 128—335.5 **5 Claims**



1. A method for the treatment of stress urinary incontinence or the incompetent cervix in pregnancy comprising forming a loop from a flexible surgical suture submucosally at the level of the internal os of a mammal, placing the ends of said suture in lapping relationship in a cylindrical crimpable sleevem and crimping said sleeve so as to impinge on the ends of said suture and lock the suture in the form of a loop.

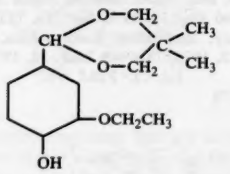
4,128,101

TOBACCO COMPOSITIONS CONTAINING 3-ETHOXY-4-HYDROXYBENZALDEHYDE 2,2-DIMETHYL PROPANEDIOL ACETAL

Kurt Kulka, New York, N.Y.; Frank Mild, Westwood, N.J., and Frank Fischetti, Jr., Flushing, N.Y., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed May 10, 1977, Ser. No. 797,508
Int. Cl.[2] A24B *3/12*
U.S. Cl. 131—17 R **8 Claims**

1. A composition comprising tobacco having incorporated therein the compound 3-ethozy-4-hydroxy-4-benzaldehyde 2,2-dimethyl-propandiol acetal having the formula:

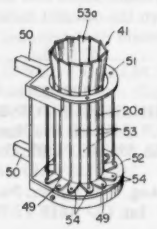


4,128,102

INCORRECT COIN STACKING DETECTING DEVICE IN A COIN PACKAGING MACHINE

Kazuto Asami, and Hirokuni Matono, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Aug. 30, 1977, Ser. No. 829,093
Claims priority, application Japan, Sep. 2, 1976, 51-117888[U]
Int. Cl.[2] G07D *9/04*
U.S. Cl. 133—1 A **3 Claims**



1. In a coin packaging machine in which after a predetermined number of coins fed into a coin stacking cylinder are stacked in a predetermined stacking state, a wrapping paper is wrapped around the coins thus stacked, the improvement comprising an incorrect coin stacking detecting device which comprises a coin stacking cylinder provided with a plurality of terminal boards electrically insulated from one another, said terminals being arranged along the inner wall of said coin stacking cylinder in such a manner that said terminal boards extend in the axial direction of said coin stacking cylinder and are connected to the positive and negative terminals of an

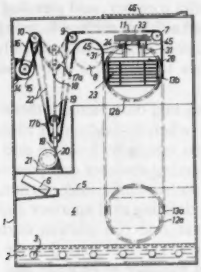
electric source so that adjacent terminal boards are opposite in polarity.

4,128,103

DEGREASING APPARATUS

Göte J. W. Nörstrom, Karlstad, Sweden, assignor to Uddeholms Aktiegolag, Gagfors, Sweden

Filed Dec. 14, 1977, Ser. No. 860,387
Claims priority, application Sweden, Jan. 21, 1977, 7700669
Int. Cl.[2] B08B *3/08, 3/10*
U.S. Cl. 134—143 **3 Claims**



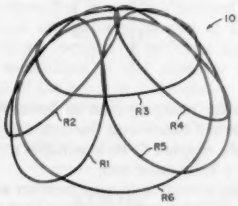
1. Degreasing apparatus comprising a container (1) for liquid or gaseous solvent, a basket-holder (12, 13) arranged to receive open baskets (23) containing the goods to be degreased, a lifting means (17 - 22) to lower the basket-holder (12, 13) into and lift it out of the solvent, a rotary means (14 -16) to set the basket-holder (12, 13) in rotation, and a lid (25) fitted in the basket-holder (12, 13) to close the basket (23) during the degreasing operation, characterized in that the basket-holder (12, 13) includes levers (31) arranged to cooperate with the lid (25) and also, during the lifting movement of the basket-holder (12, 13), to come into contact with a stationary stop (33) and thus lift the lid (25) from the basket (23) when the basket-holder (12, 13) is in its highest position.

4,128,104

RING STRUCTURE

Bernard S. Corey, Corpus Christi, Tex., assignor to Foy McCullough and Lyle D. Galbraith, both of Redmond, Wash.

Filed Dec. 19, 1977, Ser. No. 861,645
Int. Cl.[2] A45F *1/00*
U.S. Cl. 135—3 R **3 Claims**



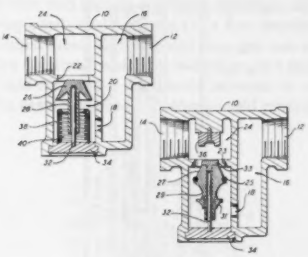
1. A structure composed of a plurality of ring members at least five in number, each ring member extending over and under at least four other ring members in a manner such that each ring extends, in sequence, over and under a first ring member, over a second ring member, under a third ring member, over and under a fourth ring member, over the third ring member, and under the second ring member.

4,128,105

AUTOMATIC SHUT-OFF VALVE AND METHOD OF OPERATION THEREOF

John L. Follett, 14554 Richmond Ave., Fair Haven, N.Y. 13064

Continuation-in-part of Ser. No. 538,537, Jan. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 322,735, Jan. 11, 1973, abandoned. This application Jun. 9, 1976, Ser. No. 694,206
Int. Cl.[2] F16K *17/28, 17/38*
U.S. Cl. 137—1 **9 Claims**



1. An automatic shut-off valve operable to seal off flow in a fluid supply line in response to the rate of flow exceeding a predetermined value, said valve comprising, in combination:

(a) a valve body having inlet and outlet ends with a fixed valve seat therebetween;

(b) a flow control chamber between said inlet end and said valve seat defined by an interior wall of said valve body;

(c) a closure element movable between open and closed positions relative to said seat;

(d) means supporting said closure element within said chamber in a position between said inlet end and said valve seat;

(e) a permanent magnet associated with one and a magnetically permeable material with the other of said closure element and said valve body, said magnet and material being so arranged that the attractive force exerted by said magnet on said material is insufficient to move said closure element when the latter is in said open position, and is sufficient to maintain said closure element in said closed position when moved thereto by said excess flow rate, until reset to said open position; and

(f) said closure element including a plug tapering downwardly and outwardly from its upper end and having an upwardly disposed surface spaced from said seat when in said open position and in engagement with said seat when in said closed position, and a downwardly disposed surface likewise tapering downwardly and outwardly from its upper end and fully exposed to fluid flow through said flow control chamber, whereby said closure element is maintained by gravity on said support means until moved to engage said upwardly disposed surface with said valve seat by a flow rate in excess of said predetermined value by fluid flow acting on said downwardly disposed surface.

4,128,106

GAS LIFT VALVE WITH A TENSION SPRING BIASING ELEMENT

Bolling A. Abercrombie, Montgomery, Tex., assignor to McMurry Oil Tools, Inc., Houston, Tex.

Filed Mar. 10, 1977, Ser. No. 776,204
Int. Cl.[2] F04F *1/20*
U.S. Cl. 137—155 **13 Claims**

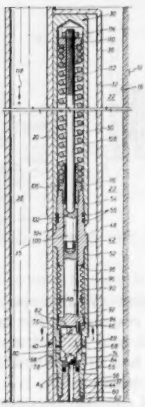
1. A gas lift valve adapted to permit communication between the interior of a production tubing string and an annular region defined between the exterior of the string of a well casing comprising:

a valve housing having an inlet port and an outlet port adapted to permit communication between the annular region and the interior of the production tubing string;

a hollow spring housing removably connected at one end of the valve housing, the interior of the spring housing defining a spring chamber therein, the spring chamber being physically isolated from the inlet and outlet ports;

a valve seat fixedly connected to the valve housing adjacent to the inlet port;

a valve element longitudinally and radially movable within the housing from a first, closed, position to a second, open, position, the valve element in the first, closed, position blocking communication between the inlet and the outlet;



a spacer extending through the valve housing, the spacer being disconnected from and physically independent of the valve element yet adaptable to abut the valve element to transmit a biasing force thereto; and,

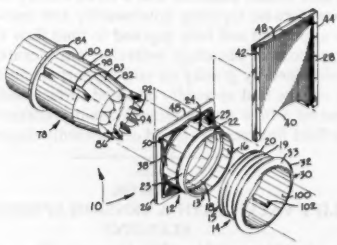
a tension spring disposed within the spring chamber and adapted to generate a biasing force transmissible through the spacer to the valve element to bias the valve element toward the closed position.

4,128,107

SURFACE IRRIGATION GATE

Harold Blumhardt, Ashley, N. Dak., assignor to Blumhardt Mfg., Inc., Ashley, N. Dak.

Filed Mar. 1, 1977, Ser. No. 773,200
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—318 **23 Claims**



15. An outlet fitting for flexible wall surface irrigation tubing in which apertures are punctured to discharge water, comprising:

(a) a first outlet member having a continuous side wall defining a first axial passageway between first and second ends thereof;

(b) a second outlet member having a continuous side wall defining a second axial passageway between first and second ends thereof, said first end of said second outlet member having a rim portion and said second end of said second outlet member received within said first end of said first outlet member with said axes aligned for axial translation of said second outlet member between a first extended position in which said outlet fitting is inserted into an aperture in said tubing and a second tightened position in which said rim portion secures the edge of said flexible wall defining said aperture against said first outlet member providing a water-tight seal thereabout; and

(c) a tube piercing member having a longitudinal axis and piercing and grasping portions, said tube piercing member axially and removably insertable within said first and second outlet members such that said piercing portion extends beyond said first end of said second outlet member and said grasping portion extends beyond said second end of said first outlet member, said piercing portion having a cutting edge and a riding surface tapering outwardly from said cutting edge in a direction generally away from said longitudinal axis toward said rim of said second outlet member; and

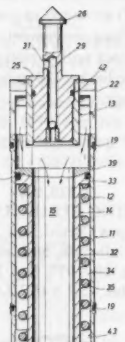
means for securing said tube piercing member to said second outlet member whereby said outlet fitting may be placed in said irrigation tubing by holding said grasping portion of said tube piercing member and puncturing an aperture in said tubing with said piercing portion, the edge of said flexible tubing defining said aperture riding up said riding surface and over said rim portion during insertion, and said second outlet member may then be tightened against said first outlet member to provide said water-tight seal.

4,128,108

MUD RETAINING VALVE

Bill B. Parker, Lafayette; Rudy Beynand, Broussard, and Arthur J. Cormier, Lafayette, all of La., assignors to American International Tool Company, Inc., Houston, Tex.

Filed Apr. 20, 1977, Ser. No. 789,018
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—327 **6 Claims**



1. In a valve for retaining mud in the kelly when the drill pipe is disconnected therefrom, the combination comprising:

a tubular body adapted to be inserted in a radially enlarged portion of a kelly saver sub;

a downwardly extending closure member supported by said body, said closure member having a bore extending axially therethrough;

an axially movable piston disposed within said body, said piston having a flange extending radially outwardly therefrom into contact with said body and a passage for the flow of drilling mud therethrough, said passage being substantially coaxial with said bore;

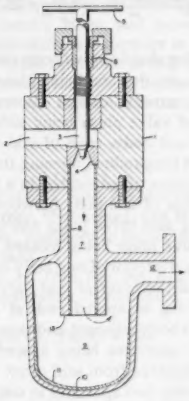
a plug inserted within said bore, said plug being removable from said bore by the application of an upward tension

force thereto so that wire line tools may be passed through said bore and said passage;
a check valve in said plug to allow mud to flow upwardly therethrough when said passage is blocked by said closure member so that downhole pressure may be detected;
and means for urging said piston axially upward so that said passage is blocked by said closure member, thereby preventing the downward flow of mud therethrough.

4,128,109
PRESSURE LET-DOWN VALVE ASSEMBLY FOR HANDLING ABRASIVE LIQUIDS

Michael C. Chervenak, Pennington, N.J., and Ronald H. Wolk, San Jose, Calif., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Dec. 30, 1975, Ser. No. 645,408
Int. Cl.² F16K *47/00*
U.S. Cl. 137—375 **11 Claims**



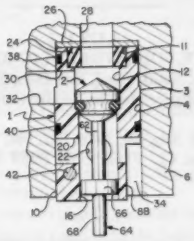
1. A let-down valve assembly comprising:
(a) a valve adapted for handling pressurized liquids containing particulate abrasive solids, and
(b) flow reversal means for receiving liquid from said valve and changing the direction of flow of said liquid, said flow reversal means including
(1) a chamber for receiving liquid from said valve and having a configuration which permits a sufficient amount of said liquid to accumulate in said chamber to absorb the momentum of the solids in said liquid,
(2) a conduit connecting the outlet of said valve with said chamber for channeling liquid from the outlet of said valve into said chamber in substantially the same direction as the liquid leaves said valve,
(3) a chamber outlet for channeling said liquid in a direction other than that in which it entered said chamber, said chamber outlet being located at a point in said chamber which permits a sufficient amount of said liquid to accumulate in said chamber to absorb the momentum of the solids in said liquid,
(4) said conduit and the surface of said chamber which is in flow alignment with said conduit being coated with an abrasive resistant material.

4,128,110
CONTROL VALVES

Harry M. Haytayan, Lincoln, Mass., assignor to Pneutek, Inc., Billerica, Mass.

Filed Dec. 27, 1976, Ser. No. 754,424
Int. Cl.² F16K *11/04*
U.S. Cl. 137—454.2 **1 Claim**

1. In combination with a tool having a port with a shoulder in said port, a control valve comprising a hollow valve casing disposed in said port, said casing having (1) a bore for accommodating a slide valve unit with said bore having an enlarged section defining a valve chamber, (2) first, second and third openings for conducting flow of fluid into and out of said casing via said valve chamber, and (3) first and second axially aligned valve seats at opposite ends of said valve chamber, said first opening being at one end of said bore and said second and third openings intersecting said bore, said second valve seat having a sloping surface, said first valve seat being comprised of a resilient cylindrical ring located in a counterbore of said bore at said first opening and said second valve seat being located between said second and third openings, said cylindrical ring being captivated between (1) a first annular shoulder which is formed along the bore and engages one side of said ring and (2) a flat metal washer which engages a second opposite side of said ring and is captivated between an end surface of said valve casing and the shoulder in said port; and



a slide valve unit having a valve stem slidably disposed within said bore and a valve head attached to the inner end of said stem and movable by said stem into engagement alternatively with said first and second valve seats, said valve head being sized so that (1) it makes a close sliding fit at its periphery with a surrounding portion of said valve casing, (2) fluid pressure applied via said port and said first opening will force said valve head way from said first valve seat toward said second valve seat, (3) when it is engaged with either said first or second valve seat it will block flow of fluid through said first or second opening respectively, and (4) at all positions along its path of travel between the two valve seats it is incapable of blocking flow of fluid into or out of said valve casing via said third opening, and said valve head comprising a peripheral groove and a seal in the form of a resilient O-ring disposed within said groove for sealingly engaging said second valve seat when said valve head is forced toward said second valve seat.

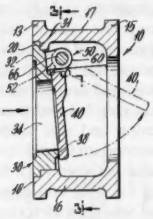
4,128,111
WAFER SWING CHECK VALVES

George E. Hansen, 2721 N. 77th Ave., Elmwood Park, Ill. 60635, and Richard T. Stvan, 2305 Sunnyside Ave., Westchester, Ill. 60153

Filed Jun. 18, 1976, Ser. No. 697,609
Int. Cl.² F16K *15/03*
U.S. Cl. 137—515.7 **9 Claims**

1. A check valve for installation in a fluid flow system comprising:
(a) a tubular body having inlet and outlet ends with a counterbore in one of said ends, said body having an outwardly extending protrusion on one side thereof defining a recess therein;
(b) a disc support positioned in the counterbore, said support having a pair of oppositely disposed faces and an opening therethrough;
(c) hinge means positioned on said disc support and extending into the recess; and,
(d) a disc pivotally supported by said hinge means, said disc

adapted to cover the opening in said disc support whereby fluid passing from said outlet raises said disc and reverse fluid flow is prevented by the closure of said disc against said disc support.

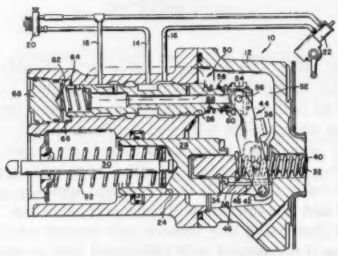


4,128,112

SPOOL VALVE FOR HYDRAULIC BRAKE BOOSTER

Arthur K. Brown, South Bend, and Dean E. Runkle, La Porte, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 19, 1976, Ser. No. 715,801
Int. Cl.[2] F16K *1/32;* B60T *13/12*
U.S. Cl. 137—544 **1 Claim**



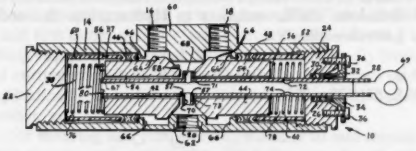
1. In a hydraulic brake booster having a housing defining a pressure chamber and a bore for axially receiving a spool valve, the spool valve including a regulating land which cooperates with a first land on the housing bore to restrict fluid communication between an inlet port and the pressure chamber when the spool valve is in a first position and to control fluid communication between the inlet port and the pressure chamber when the spool valve is moved to a second position, the regulating land having a contoured surface to accomodate fluid communication from the inlet port to the pressure chamber in the second position of the spool valve, the spool valve including a second land which cooperates with a second land on the housing bore to restrict fluid communication between the inlet port and an outlet port when the spool valve is moved to the second position, the second land on the housing bore also receiving the inlet port, the improvement in which the housing bore first and second lands are separated by a groove and the spool valve includes a third land, said third land being disposed axially between the spool valve regulating land and the spool valve second land and being separated from the spool valve regulating land and the spool valve second land by grooves, said spool valve third land cooperating with the housing bore second land when the spool valve is in the first position to form a clearance therebetween for restricting fluid communiction from the inlet port to the spool valve regulating land and for filtering out particles in the fluid communication, said spool valve third land cooperating with the groove between the housing bore first and second lands when the spool valve is in the second position to open communication from the inlet port to the spool valve regulating land, said spool valve regulating land being located downstream of said spool valve third land in both, said first and second positions of said spool valve.

4,128,113

DOUBLE PLUG SHUTTLE VALVE

William A. Hart, Saint Augustine, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 27, 1976, Ser. No. 718,270
Int. Cl.[2] F16K *11/16*
U.S. Cl. 137—627.5 **8 Claims**



1. A double plug shuttle valve comprising a body, said body having a hollow interior and being closed at one end thereof and having a centrally located opening at the other end thereof, a pair of valve plugs being slidably mounted within said interior of said body, each of said valve plugs having a centrally located longitudinal opening therein, means for biasing one of said valve plugs located in a first chamber formed within said interior of said body between said one end of said body and one of said valve plugs and means for biasing the other of said valve plugs being located in a second chamber formed within said interior of said body between said other end of said body and the other of said valve plugs, each of said valve plugs having a tapered end, at least three apertures located with said body adjacent said tapered ends of said valve plugs, one said apertures being spaced circumferentially a predetermined distance from said other two apertures in said body and said other two apertures in said body being spaced a predetermined distance longitudinally from each other, outstanding portions formed on said body adjacent said apertures for engaging said tapered ends of said valve plugs and an actuator passing through said centrally located openings in said valve plugs and being slidably mounted within said central opening at the other end of said body, said actuator being hollow, having an opening at one end thereof and being closed at the other end thereof, a pair of extensions protrude from said actuator intermediate the ends thereof, each of said extensions having an outlet therein and another pair of outlets located within said actuator between said extensions and said closed end of said actuator whereby upon the movement of said actuator said valve plugs are displaced accordingly thereby allowing for the systematic flow of fluid between said apertures.

4,128,114

YARN WASTE REMOVING MEANS FOR AIR JET WEAVING LOOM

Shigenori Tanaka, Hachioji, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Sep. 27, 1977, Ser. No. 836,957
Claims priority, application Japan, Dec. 17, 1976, 51-50734
Int. Cl.[2] D03D *47/30*
U.S. Cl. 139—435 **7 Claims**

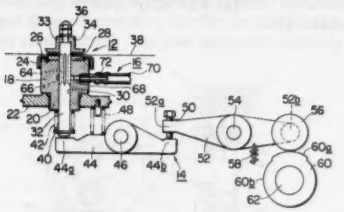
1. An air jet weaving loom, comprising:

weft yarn grasping means including stationary and movable members which are contactable with each other to grasp a weft yarn, and a rod member which slidably passes through a hole in said stationary member and connects at its head portion to said movable member;

actuating means for axially reciprocating said rod member to move said movable member reciprocatively relative to

said stationary member for allowing said grasping means to alternately grasp and release said weft yarn; and

yarn waste removing means including at least one passage which is defined between said rod member and said stationary member so as to extend along the axis of said rod member, said passage having an end open to a clearance defined between said movable and stationary members



adjacent said rod member and the other end connecting to an air pump, whereby when said movable member is separated from said stationary member to form said clearance in response to the operation of said actuating means, a stream of air flowing through said passage is formed to remove any yarn waste and miscellanea gathering in said clearance.

4,128,115

ENTRAINING ELEMENT FOR A GRIPPER SHUTTLE

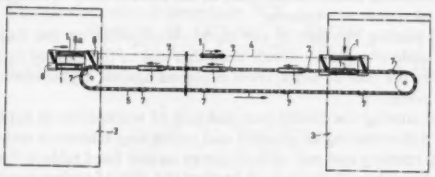
Rudolf Braun, Winterthur, Switzerland, and Werner Kellmann, Allensbach, Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 31, 1978, Ser. No. 873,778

Claims priority, application Switzerland, Feb. 4, 1977, 1352/77

Int. Cl.[2] D03D *47/24*

U.S. Cl. 139—439 **13 Claims**



1. An entraining element for a gripper shuttle weaving machine, said element comprising

a carrier for mounting on a conveyor chain;

a striking member mounted on said carrier, said striking member including a resilient striking plate having a striking surface extending transversely to a gripper shuttle path; and

a support member mounted within said striking member in spaced relation behind said striking plate to define a gap therebetween.

4,128,116

METHOD AND APPARATUS FOR OPENING AND STACKING BAGS

Werner Uthoff, Beckum, and Olaf Kluepfel, Ahlen-Vorheim, both of Fed. Rep. of Germany, assignors to Haver & Boecker Drahtweberei und Maschinenfabrik, Westfalen, Fed. Rep. of Germany

Filed Aug. 23, 1977, Ser. No. 827,016

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638415; Aug. 4, 1977, 2735126

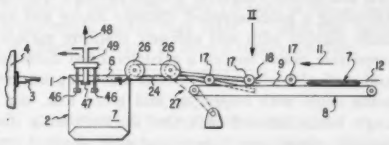
Int. Cl.[2] B65B *1/04*

U.S. Cl. 141—1 **36 Claims**

1. A process for opening the valves of valved bags each having a bag top and a bag body and for inserting the opened bags on spigots to fill the bags with bulk material, comprising the following steps:

(a) consecutively advancing the bags in a substantially horizontal plane towards the spigots, while the bag valve is oriented in the advancing direction of the bags; said advancing step includes guiding each bag by a free edge of the bag top;

(b) pivoting, during the advancing step, the top of each bag from a horizontal orientation, in which it is substantially coplanar with the bag body into a predetermined inclined position about a top fold line;



(c) pivoting, subsequent to step (b), that half of the bag top which is oriented towards the bag body, about said top fold line, back into a predetermined inclined position with respect to the bag body, whereby the bag top assumes configuration of an inverted V;

(d) pivoting, subsequent to step (c), the bag body downwardly into a vertical orientation;

(e) raising, subsequent to step (d), at least the valve-containing portion of the bag relative to the bag body for opening the valve while holding the bag body; and

(f) inserting the bag on the respective spigot.

4,128,117

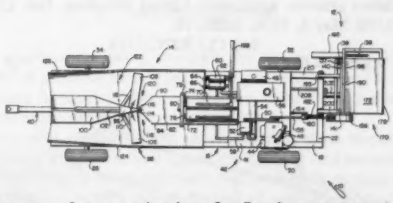
LOG PREPARING APPARATUS

James A. Terry, deceased, late of Delaware County, Ohio; Barbara P. Russell, heir, 2354 Marion Bucyrus Rd., Marion, Ohio 43302; James F. Terry, heir, 50 Homestead Ln., Delaware, Ohio 43015, and Shirley A. Cain, heir, 260 Belvedere, Columbus, Ohio 43223

Filed Jul. 25, 1977, Ser. No. 818,566

Int. Cl.[2] B27L *7/00*

U.S. Cl. 144—3 K **9 Claims**



1. Apparatus for preparing logs for fireplace usage and the like comprising:

a frame;

means for supporting said frame a select distance above ground surface;

hydraulic ram means mounted upon said frame and having piston rod means extensible and retractable with respect thereto along a given axis;

log engaging means fixed to and moveable with an outwardly disposed end of said piston rod means;

an elongate platform fixed to said frame, having an upwardly disposed surface parallel to said given axis, positioned a predetermined distance below said axis, having a width of sufficient extent for temporarily supporting logs placed thereon with stability and in substantial alignment with said given axis, and having a predetermined length extending from the vicinity of said hydraulic ram means to a terminal portion adjacent a composite log splitting wedge

assembly, said terminal portion tapering to a point at said assembly

said assembly being fixedly mounted upon said frame and including a vertical wedge of predetermined internal angular extend having a splitting edge extending substantially from and normally to the plane of said elongate platform surface in substantial alignment with said given axis, and first and second transverse wedges of predetermined internal angular extent respectively fixed to and extending in symmetrically disposed fashion from oppositely disposed surfaces of said vertical wedge, each said first and second transverse wedges having a splitting edge extending a predetermined distance above and substantially parallel with said elongate platform surface from respective points spaced a predetermined distance from said vertical wedge splitting edge and at a predetermined acute angle with respect to said given axis, said acute angle being selected such that the outwardly disposed portions of said transverse wedge splitting edges contact a log urged into said wedge assembly prior to contact therewith by corresponding inwardly disposed portions of said transverse wedge splitting edges;

motor means mounted upon said frame for providing a drive output;

pump means mounted upon said frame and responsive to said motor means drive output for applying fluid under pressure to said hydraulic ram means; and

valve means actuable for controlling said application of fluid under pressure to said hydraulic ram means.

4,128,118

TOOLING JIG

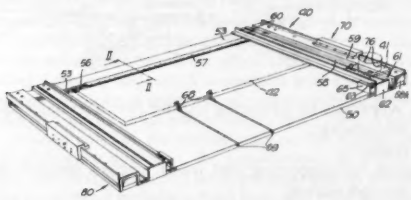
Douglas F. C. Ede, Tunbridge Wells, England, assignor to Bondgrade Limited, Slough, England

Filed Jan. 26, 1977, Ser. No. 762,712

Claims priority, application United Kingdom, Jan. 27, 1976, 3150/76; May 4, 1976, 18259/76

Int. Cl.[2] B27C *5/10*

U.S. Cl. 144—134 D **13 Claims**



1. A tooling jig comprising, in combination:

(a) a base for supporting a workpiece;

(b) a longitudinally-extending guide fence provided on said base, said guide fence defining a straight edge;

(c) a bridge directly secured to said guide fence and positioned effective to overlie a workpiece placed against said guide fence; and

(d) a guideway on said bridge extending accurately perpendicular to and intersecting the line of said straight edge, said guideway being adapted to guide for movement therealong a router accurately perpendicular to said straight edge.

4,128,119

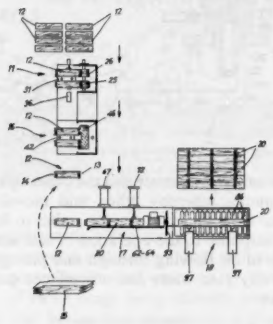
APPARATUS FOR PROCESSING WORKPIECES IN THE FORM OF SHORT-LENGTH ELONGATE TIMBER WASTE INTO USABLE TIMBER

Fred Maier, Port Washington, N.Y., assignor to Festo-Maschinenfabrik Gottlieb Stoll, Esslingen, Fed. Rep. of Germany

Filed Jun. 22, 1976, Ser. No. 698,685

Int. Cl.[2] B27F *1/08*

U.S. Cl. 144—317 **20 Claims**



20. A method for processing short lengthed, elongate waste timber workpieces into usable timber beams of relatively long length which comprises

(a) placing waste timber workpieces in pairs on a movable table of a tenon-cutting machine;

(b) clamping the workpieces in place on said movable table;

(c) cutting tenons in one of the ends of each of the pair of timber workpieces;

(d) rotating the pair of timber workpieces on the movable table;

(e) cutting tenons in the other of the ends of each of the pair of timber workpieces;

(f) placing the pair of cut timber workpieces on the fixed table of a gluing device such that one of the ends of each of the pair of workpieces is placed against a glue-coated comb;

(g) moving the combs past said pair of workpieces to apply a thin coating of glue on said contacting tenon-cut ends;

(h) rotating said pair of workpieces on said fixed table so that the other of the ends of each of the pair of timber workpieces is placed against a glue-coated comb;

(i) moving the combs past said pair of workpieces to apply a thin coating of glue on said contacting tenon-cut ends;

(j) pressing together the glue-coated tenon-cut ends of said pair of workpieces to form a timber beam;

(k) sequentially pressing a further glue-coated tenon-cut end of additional waste timber workpiece to an exposed glue-coated tenon-cut end of the timber beam of (j) to produce a longer timber beam; and

(l) cutting the longer timber beam of (k) to the desired length using a cutting device.

4,128,120

TAMBOUR DOOR AND HOUSING ASSEMBLY

Frederick J. Frey, Conway, Ark., assignor to InterRoyal Corporation, New York, N.Y.

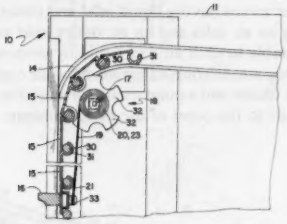
Filed Aug. 17, 1977, Ser. No. 825,365

Int. Cl.[2] E05F *11/54*

U.S. Cl. 160—191 **10 Claims**

1. In a tambour door and housing assembly, the housing including a pair of spaced apart tracks defining a path having a generally vertical first section with top and bottom parts, a generally horizontal second section near the top part of said first section, and a curved third section interconnecting said first and second sections, and a tambour door having top and

bottom parts and side edges slidably disposed in said tracks so that the door is movable along said path, said door comprising a plurality of longitudinal segments, each having opposite ends which define said side edges of the door, said segments being situated side-by-side with their adjacent edges pivotally engaged in hinge couplings, with a pitch distance P between said couplings, the improvement in combination therewith of a counter-balancing system comprising: a shaft mounted in said housing and situated generally parallel to said door segments, gear means comprising a first gear mounted rotatably on said



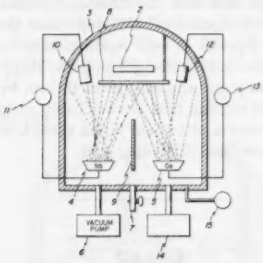
shaft, the gear having teeth with a circular pitch distance between teeth corresponding to said pitch P of said door, said gear situated such that the teeth thereof each engage one door coupling successively as the door moves in the path and said gear rotates, and a Negator spring having an upper end coiled and freely rotatable about said shaft and a lower end secured to said bottom part of said door, whereby the door is subject to an essentially constant upward force from said spring generally counter-balancing the downward force due to the weight of the door, regardless of the location of the door along said path.

4,128,121

NB_3GE SUPERCONDUCTIVE FILMS

Raymond A. Sigsbee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,481
Int. Cl.[2] B23P *3/00*; C23C *27/02*
U.S. Cl. 164—46 **3 Claims**



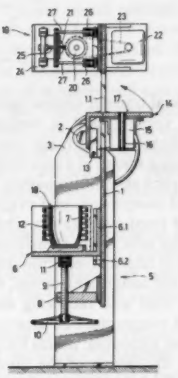
1. A control method of preparing a superconducting film having a critical temperature T_c of at least about 20° K. which comprises providing a vacuum chamber with a substrate having at least one substantially smooth surface on which said film is to be deposited, said substrate being at least substantially inert under the conditions of deposition, providing said chamber with a source of niobium and germanium, means for monitoring of niobium flux and germanium flux individually, providing said chamber with a source of oxygen, protecting said substrate surface with a movable protective means which prevents niobium and germanium flux from contacting it, reducing the pressure in said chamber to produce an evacuated chamber with a residual pressure no greater than about 10^{-5} mm Hg, heating said substrate to a temperature ranging from 750° C. to 1100° C., introducing into said evacuated chamber a partial pressure of oxygen ranging from about 1×10^{-7} mm Hg to about 1×10^{-5} mm Hg, vaporizing said niobium and germanium to produce an impinging flux composition ranging from about 1 part to about 3 parts of niobium to about 1 part of germanium, removing said protective means from said structure, and impinging said substrate with said niobium and germanium composition forming an adherent superconductive Nb_3Ge film thereon ranging in composition up to about 2 atomic % from stoichiometric composition, for a constant rate of impingement of said niobium and said germanium on said substrate with increasing substrate temperature from 750° C. to 1100° C. said partial pressure of oxygen increasing up to about 1×10^{-5} mm Hg and said amount of niobium decreasing down to about 1 part being about 1.5 parts or less at said substrate temperature higher than 1000° C., said film having at least a thickness sufficient to form a continuous film.

4,128,122

CONTINUOUS CASTING ASSEMBLY

Heribert A. Krall, Würzburg, and Helmut Maag, Waldbüttelbrunn, both of Germany, assignors to Technica-Guss GmbH, Würzburg, Germany

Filed Jul. 8, 1977, Ser. No. 814,070
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710680
Int. Cl.[2] B22D *11/10*
U.S. Cl. 164—438 **4 Claims**



1. A continuous casting assembly for use in casting small quantities of precious metals, said casting assembly comprising:

a holding furnace slidably secured to a pivotable frame, said furnace including a heatable crucible;

a cooler and mould carried on a mounting plate assembly pivotally secured to said frame, a portion of said mounting plate assembly being provided with a sealing surface for engagement with a mouth portion of said crucible when said mounting plate assembly is pivoted into contact with said crucible;

means for raising and lowering said holding furnace on said frame, said means including a threaded spindle passing through a spindle guide secured to said frame, said spindle contacting said furnace through a disc-spring column to raise and lower said furnace on said frame, said furnace having a guide which slidably engages guide strips carried on said frame;

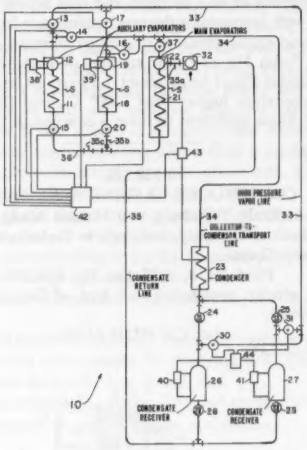
a withdrawal device for a strand cast by said continuous casting assembly, said withdrawal device being carried by said frame; and

means for pivoting said frame whereby said holding furnace and said mould and cooler carried by said mounting plate assembly, whose sealing surface has been brought into engagement with said mouth of said crucible, can be pivoted to cause flow of melted metal through said cooler and mould to said withdrawal device.

4,128,123
PASSIVE HEAT-TRANSPORT SYSTEM

John E. Garriss, 1325 E. Northern Pkwy., Baltimore, Md. 21239, and Daniel E. Garriss, 1905 Brookside Dr., Edgewood, Md. 21040

Filed Jan. 4, 1978, Ser. No. 866,861
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—1 11 Claims



1. In passive heat transfer system having means for taking in heat through a volatile fluid in evaporator means at a heat source and discharging heat from vapor of the volatile fluid through condensing means at a heat sink, and means for receiving condensate, each said means having an input and an output, the improvement comprising: said evaporator means including first, second and third evaporators with respective inputs and outputs, means for selectively transferring said vapor from the first and second or alternatively from the first and third evaporator outputs to the condensing means, and means for returning the condensate from said receiving means selectively to the first and second evaporators or alternatively to the first and third evaporators, including: means for pressurizing the receiving means from the output of the third evaporator when the first and second evaporators are transferring vapor to the condensing means, or alternatively for pressurizing the receiving means from the output of the second evaporator when the first and third evaporators are transferring vapor to the condensing means.

4,128,124
MULTI-MODE SOLAR HEATING AND COOLING SYSTEM

Mark N. Worthington, 10227 White Mtn. Rd., Sun City, Ariz. 85351

Continuation-in-part of Ser. No. 658,475, Feb. 17, 1976, Pat. No. 4,068,652, and Ser. No. 658,476, Feb. 17, 1976, Pat. No. 4,049,046, each is a continuation-in-part of Ser. No. 519,521, Oct. 31, 1976, Pat. No. 3,957,109. This application Jul. 7, 1977, Ser. No. 813,440
Int. Cl.[2] F24J *3/02;* F25B *29/00*
U.S. Cl. 165—48 S 12 Claims

1. A solar heating and cooling system comprising:

(a) a solar collector/heat exchanger unit including,

I. an enclosure having a solar window heat trap therein and disposed with a vertical component to provide upper and lower ends,

II. an air compartment in said enclosure and having air inlet and outlet ducts extending therefrom,

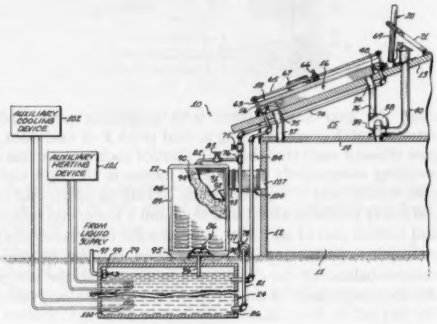
III. duct means having a blower therein for connecting the air inlet and outlet ducts of said air compartment with a point of use for circulating air through said air compartment,

IV. a liquid compartment in said enclosure above said air compartment and having liquid inlet and outlet pipelines, said liquid compartment and said air compartment coextensive and in contiguous engagement with each other for transferring thermal energy therebetween;

(b) a retractable cover panel assembly adjacent said solar collector/heat exchanger unit and movable between positions of covering and uncovering said solar collector/heat exchanger unit;

(c) evaporator means having liquid inlet and outlet pipelines and having an air inlet and an air outlet, said evaporator means operable to chill air and liquid by evaporation;

(d) air directing means coupled between the air outlet of said evaporator means and a point of use for selective directing of chilled air to the point of use or to ambient;



(e) a liquid storage tank below said solar collector/heat exchanger unit and said evaporator means, said liquid storage tank having the liquid outlet pipeline of said evaporator means coupled thereto and having the liquid outlet pipeline from said liquid compartment of said solar collector/heat exchanger unit coupled thereto; and

(f) a liquid supply line connected on one end thereof to said liquid storage tank with the other end connected to both the liquid inlet pipeline of said evaporator means and the liquid inlet pipeline of said liquid compartment of said solar collector/heat exchanger unit, said liquid supply line having a pump and shutoff valves therein by which the liquid in said storage tank is switchably supplied to said evaporator means or to said liquid compartment of said solar collector/heat exchanger unit.

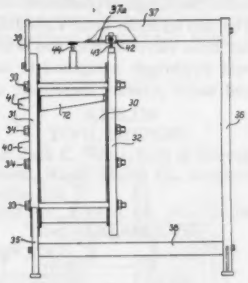
4,128,125
SPIRAL HEAT EXCHANGER

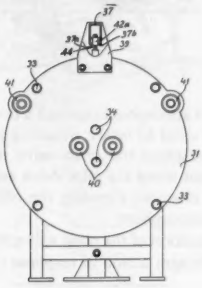
Leif R. Borjesson, Vellinge, and Lars-Ake Johansson, Lund, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Aug. 26, 1976, Ser. No. 718,032
Claims priority, application Sweden, Aug. 28, 1975, 7509552
Int. Cl.[2] F28F *3/08*
U.S. Cl. 165—163 6 Claims

1. A spiral heat exchanger comprising at least one generally cylindrical spiral body forming parallel, spirally-shaped flow passages for heat exchanging media, said body including at least two sheets spirally wound around a common axis to define said flow passages between the sheets, each said sheet having opposite side edges, an end wall releasably connected to the spiral body at each end thereof, the end walls having inlet and outlet means communicating with said flow passages and being located adjacent said opposite side edges, respectively, of the sheets, a track, and means mounting the spiral

body and one end wall on the track for movement therealong, said mounting means including elements supportined said





spiral body and said one end wall for rotation independently of each other about respective vertical axes.

4,128,126

APPARATUS FOR SUPPORT OF SHEET-METAL-TYPE HEAT EXCHANGER MATRICES FOR RECUPERATIVE HEAT EXCHANGE

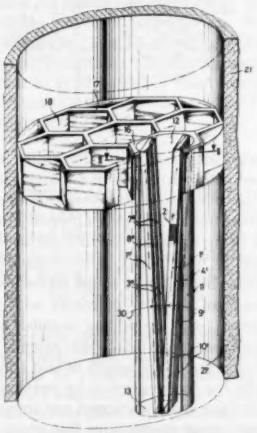
Siegfried Förster, Alsdorf, and Manfred Kleemann, Quadrath, both of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft m.beschränkter Haftung, Julich, Germany

Filed Oct. 26, 1976, Ser. No. 735,135

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2549052

Int. Cl.[2] **F28D** *9/02*

U.S. Cl. 165—165 **8 Claims**



1. In an apparatus supporting and including sheet-metal-type heat exchanger matrices that are constituted of uniformly repeated folds of reciprocally folded strips closed off at the ends of the folds formed by the strip edges and partially covered with first and second cover plates respectively touching the oppositely disposed apices of the folds that run across the strips, so as to define, by the portions of the matrices left uncovered, both inlets and outlets to the fold chambers for each of two flowing exchanging media that, in operation, are separated in heat-exchanging relation by said folded strips, said apparatus being capable of operation at high efficiency with substantial differences in the pressures of the respective media, the combination of:

a tubular casing (**11**);

at least one pair of said heat exchanger matrices (**1'**, **1''**) of said type connected in parallel, inserted in said tubular casing (**11**), aligned on planes extending from one end (**12**) to the other (**13**) of said casing (**11**), positioned in said casing so as to converge towards each other longitudinally at an acute angle and disposed in mirror image relation to each other with regard to the flow of the respective media into and out of the matrices;

first gas-tight duct-separating partitions (**14**) in said casing extending between back-to-back first cover plates (**3'**, **3''**) of the respective matrices of said pair of matrices, for separating from each other the inlet and outlet ducts for a first one of said media, said ducts respectively communicating with the fold chambers of each of said matrices by inlet portions (**7'**, **7''**) and outlet portions (**8'**, **8''**) of said matrices left uncovered by said first cover plates (**3'**, **3''**);

second gas-tight duct-separating partitions (**15**) in said casing respectively between second cover plates (**4'**, **4''**) of the matrices of said pair of matrices and said casing, for separating from each other the inlet and outlet ducts for the second of said media, said last-mentioned ducts respectively communicating with the fold chambers of each of said matrices by inlet portions (**9'**, **9''**) and outlet portions (**10'**, **10''**) of said matrices left uncovered by said second cover plates (**4'**, **4''**);

gas-tight thermal expansion compensation means (**19'**, **19''**) sealing gaps respectively between opposite edges of said strips (**2'**, **2''**) of said heat exchanger matrices (**1'**, **1''**) and opposite portions of the inner wall surface of said tubular casing (**11**);

an end plate (**16**) affixed to one end (**12**) of said casing (**11**) and providing an outwardly extending end flange for vertically suspending said casing on a carrier framework, said flange having a polygonal contour for anti-rotative locking with similar flanges of other similar tubular casings, and

a carrier framework (**17**) mounted in fixed position in a massive hollow structure (**21**) and providing a plurality of honeycomb-like cells (**18**) each open at top and bottom on which a plurality of tubular casings, including said casing, are supportable in suspension by end plates like said end plate (**16**), said end plate being seated on said carrier and suspending said casing thereon in a position passing through one of said cells (**18**) and occupying and interfitting laterally snugly with end plates affixed to other tubular casings passing through other cells of said carrier.

4,128,127

SWIVEL CONNECTOR

Donald F. Taylor, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Sep. 23, 1977, Ser. No. 835,872

Int. Cl.[2] **E21B** *43/00;* **F16L** *39/00*

U.S. Cl. 166—105 **9 Claims**

9. A well production apparatus, comprising:

a production tubing string;

a pump;

a locking mandrel connected to said pump and supporting said pump within said string;

a swivel joint connected to said pump said swivel joint including;

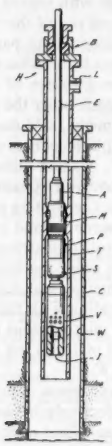
a ball member having a tubular leg extending therefrom, an exterior generally spherical surface on one end, and a central bore extending through said tubular leg and said one end;

a port defined in said ball member at a point intermediate of said spherical surfaces so that spherical surfaces are above and below the port;

a swivel cap having a bore in communication with said central bore through said ball member and a mating seat engaging said ball member;

a tubular housing having an inner mating seat engaging said ball member and surrounding said swivel cap and said ball member, said tubular leg extending through said housing;

means for retaining the mating seats of said swivel cap and said tubular housing in firm engagement with said ball member's spherical surfaces and permitting pivotal and rotational movement of said cap and said housing relative to said ball member;



an annular chamber defined by said ball member, said swivel cap and said housing in communication with the exterior of said ball port during said pivotal and rotational movement;

means for sealing said annular chamber from said central bore during said pivotal and rotational movement;

means for communicating with said annular chamber, contained within said swivel cap and said housing, to provide fluid communication from beyond said cap and said housing to said chamber;

a passage in communication with said ball member port separate from said central bore, and extending through said tubular leg; and

means for limiting said pivotal movement of said swivel cap and said housing with respect to said ball member to maintain communication between said ball port and said communication beyond said cap and said housing; and

a pump intake connected to the other side of said swivel joint having its intake passage in communication with the central bore through said swivel joint.

4,128,128

DIAPHRAGM ACTUATED SPRINKLER HEAD

James W. Mears, Warwick, R.I., assignor to Grinnell Fire Protection Systems Company, Inc., Providence, R.I.

Filed Jun. 27, 1977, Ser. No. 810,068

Int. Cl.² A62C *37/20*

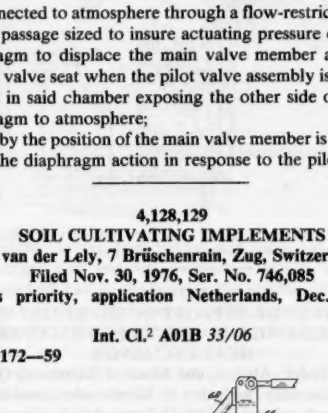
U.S. Cl. 169—37 **15 Claims**

1. A fire protection sprinkler head, comprising a main valve member engaged upon a valve seat and a pilot valve assembly adapted to actuate said main valve member, characterized in that:

said main valve member comprises a hollow bore element;

an annular flexible diaphragm is positioned within the chamber formed by sprinkler head, extending between and sealed to said main valve member and said chamber;

one side of said diaphragm is exposed to said pilot valve assembly and water pressure therefrom, said side being



connected to atmosphere through a flow-restrictive drainage passage sized to insure actuating pressure on the diaphragm to displace the main valve member away from said valve seat when the pilot valve assembly is open; and

a vent in said chamber exposing the other side of said diaphragm to atmosphere;

whereby the position of the main valve member is controlled by the diaphragm action in response to the pilot valve.

4,128,129

SOIL CULTIVATING IMPLEMENTS

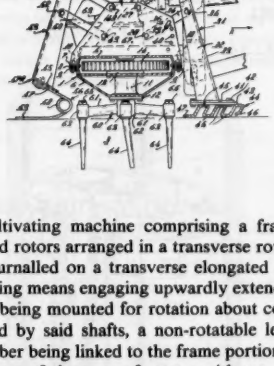
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Nov. 30, 1976, Ser. No. 746,085

Claims priority, application Netherlands, Dec. 1, 1975, 7513961

Int. Cl.² A01B *33/06*

U.S. Cl. 172—59 **23 Claims**



1. A soil cultivating machine comprising a frame and a plurality of tined rotors arranged in a transverse row and said rotors being journalled on a transverse elongated portion of said frame, driving means engaging upwardly extending shafts and said rotors being mounted for rotation about corresponding axes defined by said shafts, a non-rotatable leading soil crumbling member being linked to the frame portion and positioned in advance of the row of rotors with respect to the direction of travel, said crumbling member comprising an elongated ground engaging surface that extends transverse and substantially across the entire length of said row, said member being pivoted to the frame portion by parallelogram linkage means having linkage arms positioned one above the other and four spaced apart pivot connections that pivot about substantially horizontal axes, adjusting means interconnecting said linkage means to said machine and fixing said ground engaging

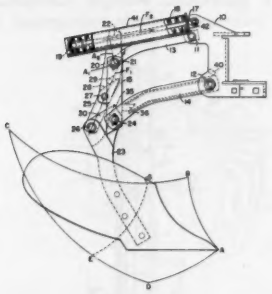
surface in any one of a plurality of supporting positions at different horizontal levels during machine travel, said member being displaceable about the pivot connections and fixable in any one of said positions, a spring mechanism on said linkage means positioned to normally bias said surface to a selected one of said positions without substantially tilting said crumbling member.

4,128,130

TOOL SUPPORT

Robert V. Green; Jack C. Wiley, both of Davenport, Iowa, and Loren G. Arnold, Rock Island, Ill., assignors to Deere & Company, Moline, Ill.

Filed Oct. 1, 1976, Ser. No. 729,504
Int. Cl.[2] A01B *61/04*
U.S. Cl. 172—266 **42 Claims**



1. In an earthworking implement of the type having a supporting frame and an earthworking tool carried by the frame, the improvement comprising means for mounting the tool on the frame for reciprocable and rotational movement within a vertical plane including: a fore-and-aft extending vertically disposed four bar linkage having four rigid pivotally connected links, one of which is a forward vertically disposed link rigid with the frame, said linkage being reciprocable between a first lowered and second elevated position; a rigid tool support; means on the tool support for pivotally depending the tool support from said linkage for rotational movement between a forward and a rear position; biasing means pivotally carried by the four bar linkage for swinging movement in a vertical plane; lever means pivotally mounted on the four bar linkage for relative rotation thereto connecting the biasing means with said linkage for urging the latter towards its first position; first connecting means on the tool support offset from the means pivotally depending said tool support from the linkage; and second means connecting said lever means with the first connecting means interconnecting the biasing means to the first connecting means so as to yieldably resist rotation of the tool from its forward position and to return said tool to its forward position after movement therefrom.

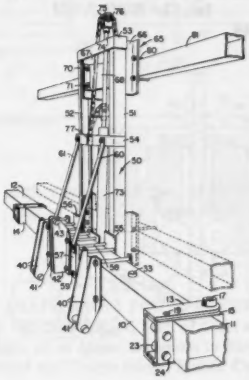
4,128,131

MULTIPLE SECTION IMPLEMENT WITH BEAM RAISED AND LOWERED ON MAST THEREOF

David H. Bucher, and Harry M. Meinert, both of Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 8, 1977, Ser. No. 822,684
Int. Cl.[2] A01B *73/00*
U.S. Cl. 172—311 **8 Claims**

7. A multiple section implement comprising: a central horizontal tool-supporting frame having opposite transversely spaced ends; a pair of transversely extending outer frames extending outwardly respectively of the opposite ends of the central frame and having inner ends pivotally mounted so that the outer frames swing laterally between fore-and-aft and transversely extending positions; means for holding the outer frames in their transversely extending positions; a vertical mast structure supporting the central frame thereon for travel up and down with respect to the mast structure; tools carried on the outer frames and the tool-supporting central frame in general predetermined attitudes; and means for raising the tool-supporting frame and its tools on and with respect to the vertical mast structure and above the level of the tools on the outer frames while maintaining the tools on the central frame substantially in the same attitude to thereby permit the outer frames to move to and from their fore-and-aft positions and the tools carried thereon to move under the tools of the central frame.

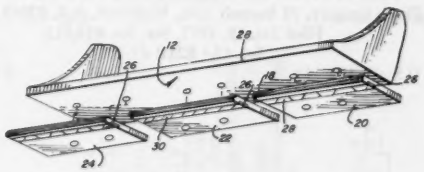


4,128,132

GROUND-ENGAGING TOOL INSERTS WITH ANGLED EDGES

Lowell J. Moen, Peoria, and Harris S. Olson, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 1, 1977, Ser. No. 829,684
Int. Cl.[2] E02F *3/80*
U.S. Cl. 172—747 **10 Claims**



1. In a cutting edge assembly for an earth-working machine having a forward cutting edge, the improvement comprising:

a channel extending generally parallel to the front cutting edge; and

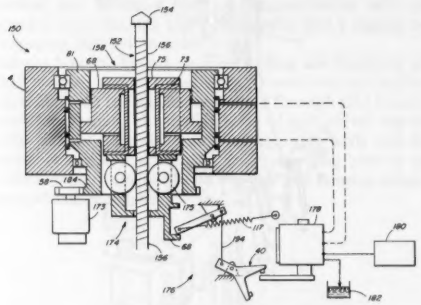
blocks of wear-resistant material inlaid within the front channel, the joints between contiguous blocks being non-parallel to the general direction of movement of the earth-working machine.

4,128,133

TORQUER/THRUSTER FOR FLEXIBLE ROOFDRILL

Hans A. Hug, Weston, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,018
Int. Cl.[2] B23Q *5/033*
U.S. Cl. 173—149 **10 Claims**



1. A device for applying rotational torque and longidutinal thrust to a flexible drill, said device comprising:

(a) a housing;

(b) a cylindrical barrel rotatably mounted within said housing;

(c) cylindrical piston means mounted within said barrel, said piston fixed against rotational movement with respect to said barrel, said piston constrained for limited longitudinal movement with respect to said barrel;

(d) collet means mounted within said piston, said collet means configured to engage and to disengage a flexible drill shaft;

(e) bladder means disposed between said piston means and said collet means, said piston means, said bladder means and said collet means fixed against movement with respect to one another;

(f) means for urging said bladder means against said collet and for longitudinally moving said piston means, said collet means engaging the flexible drill shaft when said bladder means is urged against said collet means; and

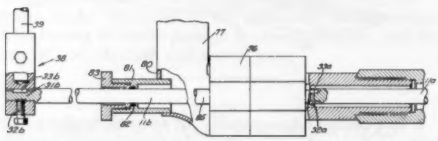
(g) friction means mounted for rotational movement with said barrel, said friction means engaging the flexible drill shaft for selectively controlling longitudinal movement of the flexible drill shaft.

4,128,134

METHOD AND APPARATUS FOR DETERMINING THE ORIENTATION OF A CORE CUT IN A BORE HOLE

Frank Gregory, 71 Summit Ave., Waldwick, N.J. 07463

Filed Jul. 19, 1977, Ser. No. 816,912
Int. Cl.[2] E21B *47/02*
U.S. Cl. 175—44 **9 Claims**



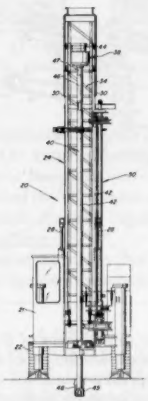
1. A device for orienting a core cut in a bore hole, an orienting rod, an inner core barrel fixed to the lower end of said rod, scribes projecting inwardly on the core barrel, a drill rod encircling said orienting rod, an outer barrel and coring bit at the lower end of said drill rod having a center opening communicating with said inner core barrel, said orienting rod extending upwardly beyond said drill rod and externally thereof, an arm extending radially from said orienting rod at the external upper end thereof in fixed relation to said rod and scribes on said barrel, means providing drilling fluid passageway between said drill rod and the parts encircled thereby and means for driving said drill rod, said orienting rod at the location of said arm extending above said core barrel and outer barrel leaving the arm visible to indicate the position of the scribes.

4,128,135

DRILL PIPE HANDLING MECHANISM

Ray M. Mitchhart, and Hans Zingl, both of Dallas, Tex., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Jul. 13, 1977, Ser. No. 815,347
Int. Cl.[2] E21B *19/14*
U.S. Cl. 175—52 **8 Claims**



6. A drill pipe handling and storage mechanism for use in combination with a drilling rig having an elongated upstanding mast, and a rotary head operable to traverse said mast for advancing and rotatably driving a drill stem made up of a plurality of threadedly interconnected drill pipe sections, said handling and storage mechanism comprising:

a storage rack for storing at least one drill pipe section, said storage rack including a pair of spaced apart upper and lower arms interconnected by an elongated shaft adapted for pivotally moving said arms between a position substantially in alignment with the longitudinal central axis of said drill stem for receiving and dispensing a drill pipe section and a retracted position;

support means disposed on said mast for supporting said shaft for pivotal and limited axial movement with respect to said mast;

means on said lower arm for receiving and holding the lower end of a drill pipe section in said storage rack;

resilient means interposed between said support means and said shaft for yieldably supporting said storage rack for said limited axial movement; and

means for varying a bias force exerted by said resilient means on said storage rack to compensate for the weight of a drill pipe section held by said storage rack.

4,128,136

DRILL BIT

Robert E. Generoux, North Bay, Canada, assignor to Lamage Limited, North Bay, Canada

Filed Dec. 9, 1977, Ser. No. 859,072
Int. Cl.[2] E21B *9/36*
U.S. Cl. 175—330 **6 Claims**

1. A diamond drill core bit comprising:

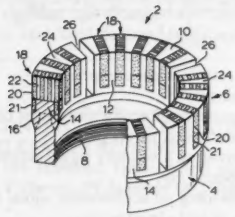
a. an annular bit body having an end,

b. an annular crown integrally secured to said end and having a cutting face and inner and outer concentric side surfaces, said crown comprising:

1. a plurality of composite segments each extending generally radially between said inner and outer side surfaces, said composite segments being spaced circumferentially from each other and being elongated depthwise of the crown and extending to said cutting face to wear with said cutting face in use,

2. a circumferential spacer material integrally adhered to said composite segments and extending circumferentially between said composite segments to space the latter circumferentially apart, said circumferential spacer material also extending generally radially between said inner and outer surfaces and being elongated depthwise of the crown and extending to said cutting face to wear with cutting face in use,

c. each composite segment comprising a plurality of diamond impregnated segments separated radially from



each other by a radial spacer material, a diamond impregnated segment being located at each of said inner and outer side surfaces, said diamond impregnated segments and said radial spacer material therebetween all extending to said cutting face,

d. said diamond impregnated segments having greater abrasion resistance than that of said radial spacer material such that said radial spacer material will wear at a controlled rate which is greater than that of said diamond impregnated segments but not so great as to prematurely expose said diamond impregnated segments,

e. said radial spacer material having greater abrasion resistance than that of said circumferential spacer material such that said circumferential spacer material will wear at a controlled rate which is greater than that of said radial spacer material, but is not so great as to prematurely expose said composite segments,

f. said circumferential spacer material having substantial thermal conductivity and ductility.

4,128,137

PERIPATETIC VEHICLES

Eric Booth, Didcot, England, assignor to National Research Development Corporation, London, England

Filed Feb. 15, 1977, Ser. No. 768,718

Claims priority, application United Kingdom, Feb. 24, 1976, 07239/76

Int. Cl.[2] B60G *25/00*

U.S. Cl. 180—6.5 **11 Claims**

1. A peripatetic vehicle comprising:

a vehicle body structure;

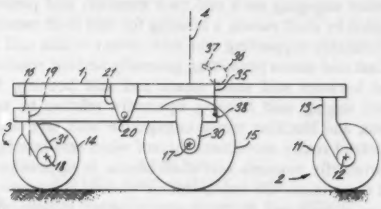
a suspension including a bogie system;

means for pivotally connecting said bogie system and said vehicle body structure one to the other for relative movement about a transverse axis;

means mounted on said bogie system defining a fixed transverse axle;

two main wheel units mounted on said axle means and disposed at least substantially transversely opposite to each other with one unit adjacent each side of the vehicle;

at least one other wheel unit carried by said bogie system, said one other wheel unit being a caster, and



at least one further wheel unit carried by said vehicle body structure, said at least one further wheel unit being a caster.

4,128,138

DIAPHRAGM FOR SPEAKER

Yasuhiro Ishii; Shintaro Hirose, both of Gifu, and Ryoichi Kawasaki, Gunma, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi and Tokyo Sanyo Eletric Co., Ltd., Gunma, both of, Japan

Filed Dec. 20, 1976, Ser. No. 752,480

Claims priority, application Japan, Dec. 24, 1975, 50-155394

Int. Cl.[2] H04R *7/12*; G10K *13/00*; B32B *3/10*

U.S. Cl. 181—167 **8 Claims**

1. A diaphragm for a speaker comprising:

a sheet for porous metal material formed from sintered metal powder and shaped in the form of the diaphragm, the pores of the metal material being void of solid material, and

a sheet of material substantially impermeable to air attached to and covering the active surface area of at least one surface of the diaphragm.

4,128,139

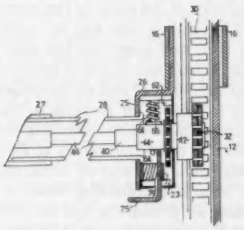
AUTOMATIC LEVELLING AND LOCKING LADDER

Jack E. Cook, Sr., 217 Cassandra Bldg. Apt. 1111, Don Mills, Ontario, Canada

Filed Dec. 7, 1977, Ser. No. 858,297

Int. Cl.[2] E06C *7/44*

U.S. Cl. 182—202 **10 Claims**



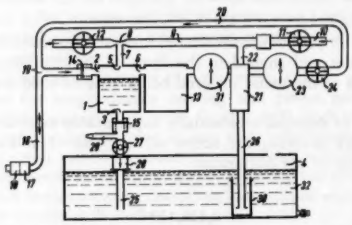
1. In a self levelling base structure for use in combination with a ladder, said ladder comprising a pair of ladder rails, said base structure including a pair of parallel, spaced apart upstanding leg members, means for mounting said leg members

for vertical sliding movement relative to said rails, each said leg member being provided with a rack member, a pinion member engaging each said rack member, said pinions being coupled by shaft means, a housing for said shaft means, means for rotatably supporting said shaft means within said housing, the last said means permitting generally vertical relative movement between said shaft means and said housing, first bias means urging said housing upwardly relative to said shaft means, and blocking means engageable with said shaft means to restrict rotary movement thereof when said housing moves downwardly towards said shaft means in opposition to said first bias means, the improvement wherein automatic locking means is provided for restricting upward movement of said housing relative to said shaft means, said locking means comprising a locking member mounted within said housing for movement between a first position permitting relative vertical movement between said housing and said shaft means and a second position interposed between said housing and said shaft means to restrict said relative vertical movement, a second bias means urging said locking member to said second position, latching means associated with said shaft means and said housing permitting movement of said locking member to said second position as said housing moves downwardly relative to said shaft means, and means for returning said locking means to said first position.

4,128,140
APPARATUS FOR RECYCLING ENGINE LUBRICATING OIL

Stanley J. W. Riches, Uppingham, England, assignor to The Post Office, London, England

Filed Mar. 24, 1977, Ser. No. 781,052
Claims priority, application United Kingdom, Mar. 25, 1976, 12071/76
Int. Cl.[2] F01M *11/04*
U.S. Cl. 184—1.5 **6 Claims**



1. Equipment for draining and refilling the lubricating oil sump of a motor vehicle, such equipment comprising a main oil reservoir with a capacity substantially greater than that of the sump, oil inlet means including a hose line and an inlet pipe for connecting the interior of the sump to the reservoir, and an oil collecting vessel having an inlet and an outlet and being of greater capacity then said sump but less then said reservoir interposed in said oil inlet means, valve means communicating with the inlet and the outlet of said oil collecting vessel, means for reducing and increasing air pressure in the oil collecting vessel, said last named means upon reducing air pressure causing said inlet valve to open causing oil to flow through said hose line and inlet pipe into said oil collecting vessel while preventing flow from said collecting vessel to said reservoir and upon increasing air pressure in said oil collecting vessel to cause oil to flow through said outlet pipe into said reservoir while closing the valve means communicating with the oil inlet of said vessel, oil outlet means communicating with said reservoir and connecting with said reservoir and connecting said reservoir to the vehicle sump and metered oil discharge means for causing metered doses of oil from the reservoir to flow through the oil outlet means.

4,128,141
ELEVATOR SYSTEM

William R. Caputo, Wyckoff, and Alan L. Husson, Budd Lake, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

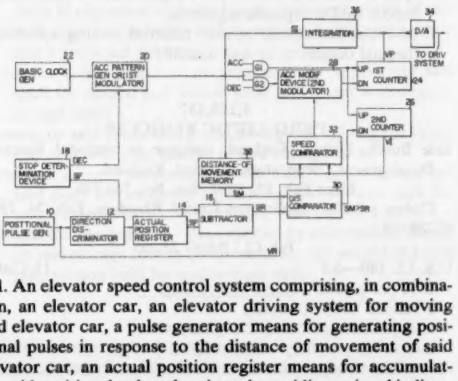
Filed Jul. 7, 1977, Ser. No. 813,560
Int. Cl.[2] B66B *5/06*
U.S. Cl. 187—29 R **10 Claims**

1. An elevator system comprising:
an elevator car,
motive means for effecting movement of said elevator car in a predetermined travel path,
means providing a velocity signal related to the velocity of said elevator car,
means providing an acceleration signal related to the acceleration of said elevator car,
means modifying said velocity signal responsive to said acceleration signal,
and monitoring means responsive to the modified velocity signal for detecting a malfunction in the operation of said elevator car.

4,128,142
ELEVATOR SPEED CONTROL SYSTEM

Tsuyoshi Satoh, and Kenzo Tachino, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1977, Ser. No. 766,508
Claims priority, application Japan, Feb. 16, 1976, 51-15596
Int. Cl.[2] B66B *1/30*
U.S. Cl. 187—29 R **10 Claims**



1. An elevator speed control system comprising, in combination, an elevator car, an elevator driving system for moving said elevator car, a pulse generator means for generating positional pulses in response to the distance of movement of said elevator car, an actual position register means for accumulating said positional pulses therein and providing a signal indicating the actual position of said elevator car, a command acceleration pattern generator means for generating a command acceleration pattern having a predetermined shape and for generating a command maximum acceleration, a command speed pattern generator means for integrating said command acceler-

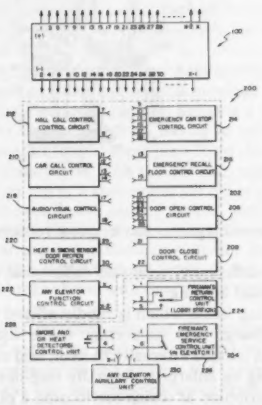
ation pattern to deliver a command speed to said elevator driving system during the acceleration of said elevator car, a stop position determination means for sensing the floor at which it is desired to stop said elevator car for producing a signal indicating the position of the desired stop floor, a subtracter means for calculating the distance to the desired stop floor by calculating the difference between the signal from said actual position register means and the signal from said stop position determination means during the decleration of said elevator car, an ideal deceleration pattern generator means responsive to the distance to the desired stop floor calculated by said substractor means during the decleration of said elevator car to provide an ideal command speed for said elevator car, a speed sensor means for sensing the actual speed of said elevator car, a speed comparator means for comparing said ideal command speed from said ideal decleration pattern generator means with the actual speed sensed by said speed sensor means, and a rate-of-acceleration modifier means responsive to the output from said speed comparator means and connected to said command acceleration pattern generator means for modifying said command acceleration pattern, whereby the actual speed of the elevator car is caused to follow the ideal command speed from said ideal decleration pattern generator means.

4,128,143

SUPERVISORY CONTROL MEANS FOR AUTOMATIC ELEVATOR SYSTEMS

Leif J. Petterson, 1164 Hartford Tpke., North Haven, Conn. 06473, and Leif E. Petterson, 89 Janeway Dr., Guilford, Conn. 06437

Filed Jun. 27, 1977, Ser. No. 810,521
Int. Cl.[2] B66B *1/46*
U.S. Cl. 187—29 R **12 Claims**



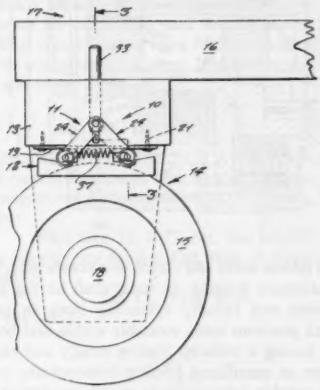
1. In combination with an automatic elevator system of the type which includes at least one car servicing a plurality of floors, said car having at least one door which opens and closes, and normal control circuit means for controlling various normal modes of operation of said elevator system, the improvement which comprises: a supervisory control means physically separated from said normal control circuit means for overriding at least one normal mode of operation of said elevator system in response to an electrical signal, said supervisory control means including a plurality of switching devices each having an electrical input and outputs, a first group of terminals electrically coupled to said inputs and outputs of said switching devices, a second group of terminals at least some terminals of which are electrically coupled to said normal control circuit means, and interconnecting means for electrically coupling at least some terminals of said first group of terminals to at least some terminals of said second group of terminals whereby said supervisory control means is readily adaptable to supervise as many normal modes of operation as desired of any elevator system.

4,128,144

BRAKE AND WHEEL LOCK

Hervey P. Vassar, Nicol Terrace, Rumson, N.J. 07760

Filed Dec. 8, 1977, Ser. No. 858,850
Int. Cl.[2] B60B *33/00*; B60T *1/04*
U.S. Cl. 188—1 D **1 Claim**

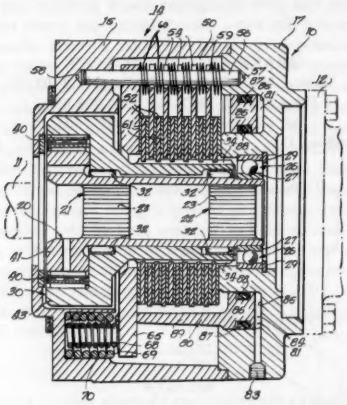


1. A brake and wheel lock for a caster assembly of a dolly, said caster assembly comprising an inverted, U-shaped yoke and a wheel rotatable on an axle supported at opposite ends thereof in said yoke beneath the center of said yoke; said brake and wheel lock including a movable mechanism and a stationary bracket; said stationary bracket comprising a flat jaw plate mounted on an underside of said yoke and a pair of integral downwardly extending tongues on opposite sides of said jaw plate, each of said tongues forming a rail means; said movable mechanism comprising a pair of parallel, spaced apart rollers, each having a pin extending therethrough, each said pin extending from said rail means on one side of said jaw plate to said rail means on the other side of said jaw plate and being slidable thereon, a pair of U-shaped frame means positioned angularly with respect to each other so as to converge together at their terminal ends, the terminal ends of each said frame means being pivotally mounted on a single slide pin and each said frame means including one of said rollers and said respective pin with opposite ends of said respective pin being pivoted in one end of a pair of parallel links, the opposite ends of said pair of links of each said frame means, forming said terminal ends, being pivoted on said slide pin, said slide pin being affixed to a lower end of a pushbutton pin slidable in a vertical hole in said yoke, said vertical hole communicating with a horizontal slot transversely through said yoke and in which said slide pin is vertically slidable, spring means secured at opposite ends thereof to the pin on each said respective roller for urging the rollers in a direction toward each other into a wedged position between the periphery of said wheel and the underside of said jaw plate for braking and locking said wheel against rotation, and a vertical downward movement of said pushbutton being transmitted through said slide pin and said links to said rollers to urge said rollers in a direction away from each other along said rail means and thereby away from the periphery of said wheel to allow rotation of said wheel.

4,128,145
COMBINATION FAILSAFE BRAKE AND ONE-WAY CLUTCH

John W. Euler, Benton Harbor, Mich., assignor to Lambert Brake Corporation, St. Joseph, Mich.

Filed Aug. 31, 1977, Ser. No. 829,471
Int. Cl.[2] F16D 67/02
U.S. Cl. 188—71.2 9 Claims



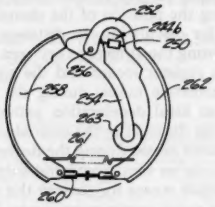
1. A fluid power brake and clutch unit comprising, in combination, a stationary housing, an inner shaft having a collared portion axially and radially extending from an uncollared portion, both positions being rotatable within said housing, an outer shaft having a collared portion axially and radially extending from an uncollared portion telescopically journalled upon and rotatable independently of the respective collared and uncollared portions of the inner shaft, the inner shaft collared portion having an outer diameter larger than the outer diameter of the outer shaft uncollared portion, disc brake means carried in the housing and connected to the outer shaft uncollared portion to retard rotation of the outer shaft, and one-way clutch means operatively interposed between the inner shaft collar and the outer shaft collar to cause the inner and outer shafts to rotate together as a unit when the inner shaft is rotated in one direction, but permitting the inner shaft to rotate independently of the outer shaft when the inner shaft is rotated in the opposite direction, the one-way clutch means thereby providing powerful braking and clutching action in a compact device.

4,128,146
REMOTE CONTROL CIRCUIT FOR ELECTRIC TRAILER BRAKES

Harold C. Hubbard, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 787,548, Apr. 14, 1977, which is a division of Ser. No. 615,234, Sep. 22, 1975, Pat. No. 4,033,630. This application Oct. 17, 1977, Ser. No. 842,477
Int. Cl.[2] B60T 13/74, 17/22
U.S. Cl. 188—138 2 Claims

1. In a system for controlling brakes of the type having a brake drum, a brake shoe movable about a fixed point relative to said drum and means moving said shoe into said drum to apply braking forces thereto, the improvement wherein said shoe is connected to said fixed point by a resilient link in the form of a U-shaped spring member connected at its respective ends to said shoe and said fixed point, and wherein said system further comprises pressure responsive means connected between respective ends of said U-shaped member to provide an

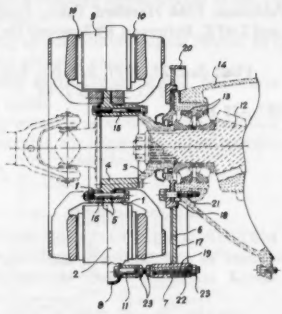


indication of braking forces applied to said drum by said shoe as a function of flexure of said member.

4,128,147
VEHICLE SPEED REDUCER OR EDDY CURRENT BRAKE

Antonio Lafuente Ruberte, Argualas St. s/n°, Zaragoza, Spain

Filed Jul. 6, 1977, Ser. No. 813,292
Claims priority, application Spain, Nov. 30, 1976, 453.792
Int. Cl.[2] F16D 65/34
U.S. Cl. 188—164 4 Claims



1. An electromagnetic force speed reducer for a vehicle, comprising:

a vehicle differential unit; said differential unit including a differential housing;

a supporting frame which is rigidly affixed to said differential housing; said supporting frame including internal bearings located internally thereof; said supporting frame including an enlarged, generally ring-like, structure having a periphery at which are located a plurality of caps;

a rotor comprised of flywheel means attached to said drive shaft and rotatable therewith; a flywheel disc attached to said flywheel means;

a drive shaft disc coupled to said drive shaft to rotate therewith and said drive shaft disc extending generally toward said flywheel means;

said flywheel means disc and said drive shaft disc being coupled for causing said drive shaft to rotate said flywheel means; the coupling of said drive shaft disc and said flywheel means disc being by means of an annular array of male and female fittings around said flywheel means axis;

said flywheel means comprise a plurality of annular flywheels arranged coaxially and spaced apart axially; said flywheel means disc projecting between two said flywheels and those two said flywheels being normally urged toward said flywheel means disc between them;

at least one annular spacing leaf interposed between the portion of said flywheel means disc projecting between

said flywheels and the adjacent said flywheel, for adjusting the separation of said flywheels;

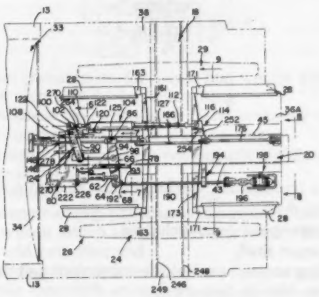
a stator comprised of a plurality of coils positioned at the vicinity of said flywheel means, such that electromagnetic lines of force will travel between said stator and said rotor;

a plurality of screws extending from said stator to said caps fixedly attaching said stator to said supporting frame; bushings in said caps into which said screws are threadedly received; said plurality of screws being adapted for micrometrically adjusting the position of said stator with respect to the position of said supporting frame.

4,128,148
BRAKE RIGGING FOR DROPPED BOTTOM GONDOLA CARS

Eugene W. Schmitt, Lockport, Ill., assignor to Harbil, Inc., Chicago, Ill.

Filed Dec. 5, 1977, Ser. No. 857,300
Int. Cl.[2] F16D *65/62*
U.S. Cl. 188—197 **7 Claims**



1. In a dropped bottom gondola car having a car body riding on wheeled trucks at either end of same in which the car body is of gondola container configuration defining a dropped bottom between the trucks, said body having at either end of its dropped bottom a horizontal shear plate fixed thereto and that is substantially coextensive with the car end, said plates each being mounted on top of a stub center sill operably connected to the truck at the respective ends of the car, with the stub sills being aligned along the longitudinal centerline of the car, a brake rigging arrangement therefor wherein the rigging at each car end applies wheel braking forces to the car end truck wheels through brake shoes, with the car end rigging comprising:

a brake cylinder mounted adjacent the dropped bottom at the level of and to one side of the car end center sill, with said brake cylinder having a thrust rod extending longitudinally of the car and directed away from its dropped bottom, with said thrust rod being reciprocably mounted in said cylinder for effecting a thrust stroke,

a cylinder lever disposed crosswise of the car and having one end of same pivotally connected to said thrust rod and the other end of same extending into the car end center sill and fulcrumed on the other side of same,

a floating lever extending generally crosswise of the car and positioned between the cylinder lever and the dropped bottom and lying in the horizontal plane of the car end sill,

said floating lever having a fulcrum adjacent one end of same and located externally of and on the other side of the car end sill,

a cylinder lever rod pivotally connected to said cylinder lever intermediate its ends and disposed within the car end center sill,

said cylinder lever rod being pivotally connected to said floating lever adjacent the other end of said floating lever and within the car end center sill,

a vertical live lever disposed between the floating lever and the dropped bottom and mounted for pivotal movement intermediate the ends thereof about a horizontal axis extending transversely of the car and for movement in a vertical plane that includes the car and center sill,

with the vertical lever upper end being disposed adjacent the level of said brake cylinder and within the car end center sill,

and means for operably connecting the vertical lever lower end to the car end brake shoes for applying the braking forces to the car end truck wheels on actuation of said brake cylinder to effect said thrust rod stroke,

a center rod pivotally connected between said vertical lever upper end and said floating lever intermediate the ends of the latter,

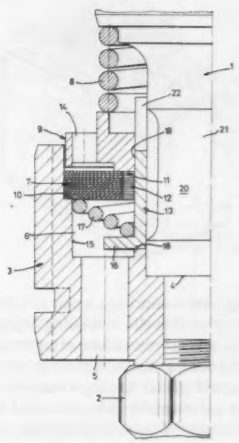
means for shifting said floating lever fulcrum longitudinally of the car in slack take up and let out directions for making the thrust stroke of the brake cylinder thrust rod of substantially uniform predetermined length,

and means for controlling said shifting means for effecting shifting of said floating lever fulcrum longitudinally of the car to compensate for wear, loss, and replacement of the car end brake shoes.

4,128,149
PISTON ARRANGEMENT FOR A SHOCK ABSORBER

Erhard Leppich, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,995
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1976, 2646771
Int. Cl.[2] F16F *9/18*
U.S. Cl. 188—322 **12 Claims**



1. A piston arrangement for a shock absorber, comprising a piston rod; a piston arranged on said piston rod so as to be axially non-displaceable relative thereto and having flow channels through which a damping medium may flow when said piston is axially displaced in the shock absorber; two valves for controlling the flow of medium when said piston is moved in opposite axial directions, respectively, each valve having a valve element which opens against a spring force, depending on the direction of axial movement of said piston and therefore on the direction of flow of the medium; the closure element of one of said valves comprising at least one disc and the closure element of the other of said valves comprising a sleeve which surrounds said piston rod, said sleeve having a flange which is exposed to the pressure of the medium when the valve is opened; said piston rod having a region of reduced diameter, part of which region is in axial alignment with said disc; said

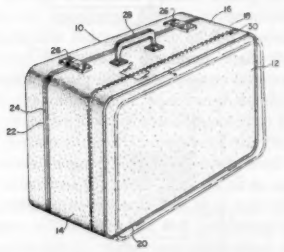
sleeve and said disc forming a space between themselves; said sleeve extending overlappingly through at least said region of said piston rod; said sleeve, when said other valve is closed, bearing with its flanged end against a first valve seat thereby to seal off said region of said piston rod and, when said other valve is open, allowing the flow of medium through both ends of said region of said piston rod; said one valve further comprising a valve element associated with said disc and a first spring acting on said valve element, said valve element being arranged on that side of said disc which is directed away from said flange of said sleeve; said valve element tightly surrounding said sleeve but permitting axial movement relative thereto; said valve element having a second valve seat near its inner circumference; said valve element, under the influence of said spring, pressing said disc near its outer circumference against a step of said piston.

4,128,150

EXPANSIBLE CARRYING CASE

Jerome L. Popkin, Trenton, and Edward F. Litwitz, Lambertville, both of N.J., assignors to York Luggage Corporation, Lambertville, N.J.

Filed Mar. 23, 1977, Ser. No. 780,444
Int. Cl.[2] A45C *7/00*
U.S. Cl. 190—44 **8 Claims**



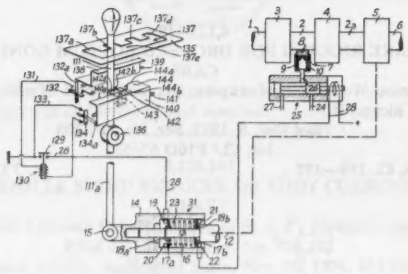
1. A carrying case comprising a pair of substantially parallel side walls, peripheral walls extending transversely between said side walls, and a gusset extending longitudinally along peripheral walls of said case in a plane substantially parallel to said side walls, said gusset having a cross-sectional configuration in a plane substantially perpendicular to said side walls that comprises a pair of outer reverse folds and a pair of inner reverse folds, each fold being defined by first and second legs extending from a junction region, the junction regions of the outer folds being closer together than the junction regions of the inner folds, the legs of each outer fold extending oppositely to the legs of the other, a first leg of each outer fold being connected to a peripheral wall, each of the inner folds having legs that extend toward the corresponding legs of the other, a first leg of each of the inner folds being connected to the second leg of an associated outer fold, and the second legs of the inner folds being connected to each other, the junction regions of the inner folds being free to move inwardly when the junction regions of the outer folds are moved apart, thereby expanding the gusset, each fold having holding means extending between the legs thereof at the leg junction region and extending along the length of the gusset for holding the legs together, the holding means in conjunction with the stiffness of the gusset material limiting the expansion of the gusset.

4,128,151

TRANSMISSION MECHANISMS FOR VEHICLES

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Apr. 6, 1977, Ser. No. 785,128
Claims priority, application France, Apr. 13, 1976, 76 10844
Int. Cl.[2] F16H *57/10*
U.S. Cl. 192—4 A **7 Claims**

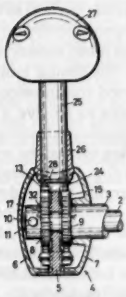


1. In a transmission mechanism for an automotive vehicle
a drive shaft,
a change-speed gear, including
an input shaft,
coupling means between the drive shaft and the input shaft of the change-speed gear,
an output shaft coupled to road wheels of the vehicle,
a reversing gear connected between the change-speed gear and the said output shaft,
brake means operable to brake the input shaft of the change-speed gear,
means for actuating the brake means,
means for selecting operating positions "forward drive" and "reverse drive" and "neutral" and "parking brake" of the reversing gear, said selecting means comprising
a linkage for effecting engagement in the said positions, including
a manually-operable control lever,
said actuating means comprising
a circuit for supplying the brake with pressure fluid, said circuit incorporating,
a solenoid valve normally interrupting the brake fluid circuit when the solenoid is de-energized,
a solenoid valve energizing circuit including
a first, normally open, switch movable to its closed position by said control lever,
a self-hold relay operable to close the first switch,
an energizing circuit for energizing the self-holding relay comprising:
a first, hold, branch interruptable by said first switch,
a second, starting, branch connected in parallel with the first branch across said first switch, the first branch including
a first contact pair co-operating with the lever so as to be open only when the lever is in one of the positions "forward drive", "reverse drive", "neutral" or "parking brake", the second branch including
a second contact pair co-operating with the lever so as to close only when the lever is moved in direction to establish a connection between said input and output shafts.

4,128,152
RATCHET TRANSMISSION

Arnold Tschursch, Hinrichssegen, Fed. Rep. of Germany, assignor to Fritzmeier AG, Lenzburg, Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,176
Int. Cl.[2] F16D *41/16, 21/06;* B60N *1/06*
U.S. Cl. 192—43.1 **13 Claims**

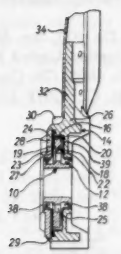


1. A ratchet transmission for height and weight adjustment of suspension seats of vehicles, comprising:
two independent gear-shift-lever shafts rotatably disposed about a common axis within a gear casing;
a pair of ratchet wheels being respectively rigidly fixed on said gear-shift-lever shafts;
a cam disc abutted by the gear casing;
a pair of counter-acting, pre-tensioned pawls for each of said ratchet wheels which are selectively latchable thereto by turning said cam disc; and
a turning knob, protruding radially from the gear casing, and swivelable therewith around the axis of said gear-shift-lever shaft.

4,128,153
VISCOUS SHEAR FLUID COUPLINGS

Peter L. Main, Huddersfield, England, assignor to Holset Engineering Company Limited, Huddersfield, England

Filed May 6, 1977, Ser. No. 794,696
Claims priority, application United Kingdom, May 11, 1976, 19236/76
Int. Cl.[2] F16D *35/00*
U.S. Cl. 192—58 B **4 Claims**

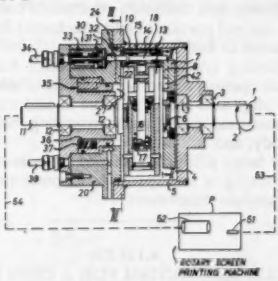


1. A viscous shear fluid coupling comprising a first annular rotatable member, a second rotatable member having an internal annular chamber receiving said first annular member, said first and second annular members having opposed radially extending surfaces in close-spaced relationship, viscous coupling fluid in said chamber for transmitting torque from one member to the other member upon rotation of the one member as a driving member to rotate the other member as a driven member and at least one groove across each said radially extending surface of the driving member, the radially inner end leading the radially outer end of each groove in the direction of operational rotation of the driving member whereby to cause said viscous coupling fluid to be pumped only towards the periphery of the driving member upon rotation of the said driving member in the latter direction thereby coupling and journaling said driven and driving members relative to one another, said coupling having at least one cavity formed in at least one of said radially extending surfaces of the chamber to provide fluid storage reservoirs for said viscous coupling fluid, said coupling further comprising a layer of non-metallic anti-friction material on at least those parts of said radially extending surfaces of said annular chamber which are in close-spaced relationship with said radially extending surfaces on the driving member.

4,128,154
POSITIVE ENGAGEMENT CLUTCH WITH SOFT ENGAGEMENT MOTION

Heinrich Voegelin, Wiler b. Utzenstorf, Switzerland, assignor to Fritz Buser AG Maschinenfabrik, Wiler b. Utzenstorf, Switzerland

Filed Mar. 11, 1977, Ser. No. 776,736
Claims priority, application Switzerland, Mar. 12, 1976, 3116/76
Int. Cl.[2] B41F *13/24*
U.S. Cl. 192—67 P **18 Claims**



1. Positive engagement clutch having
a housing (5) forming a position reference;
a driving shaft (1) journalled in the housing;
a driven shaft (11) journalled in the housing;
a coupling unit (13) secured to and rotating with the driven shaft (11) and having engagement means (14) engageable with the driving shaft (1) to selectively couple the driving shaft and the driven shafts together, or to separate said shafts and to couple the driven shaft (11) to the housing (5) to lock the driven shaft with respect to the reference position of the housing,
wherein the engagement means (14) comprises
a slidable engagement pin or rod (14);
a rotating cam track element (7, 8) secured to the driving shaft (1) and carrying a rotating guide cam track (8);
a fixed cam track element (20) secured to the housing (5) and carrying a fixed cam track (22) positioned in facing relation to the rotating cam track (8), the engagement pin (14) being selectively engageable with either, or both said cam tracks;
and operating means (30, 35) engageable with the engagement pin or rod (14) to move the pin, selectively, into engagement with the fixed and the moving cam track elements.

4,128,155

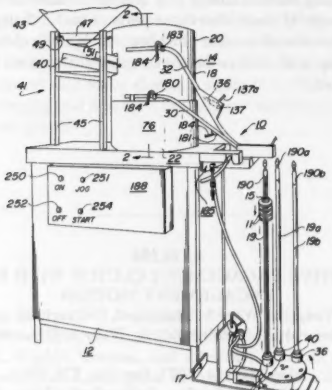
TRANSITION ATTACHMENT FOR A CORE-SPACER-CORE MANDREL LOADER

James P. Gerhart, 1506 Pheasant Dr., Warminster, Pa. 18974

Continuation of Ser. No. 629,416, Nov. 6, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,235

Int. Cl.[2] B65G 57/16

U.S. Cl. 193—46 **3 Claims**



1. A transition attachment for a core and spacer supporting mandrel wherein said transition attachment comprises

means at one end portion of said attachment for securing said attachment to said mandrel,

a body having symmetrical guide walls forming a flared entrance opening to receive a portion of said spacer and to axially align said spacer relative to said mandrel,

said symmetrical guide walls extending helix-like around said body, and

said body being elliptically shaped in cross-section to minimize cocking of said spacer as it enters and moves along said transition attachment.

4,128,156

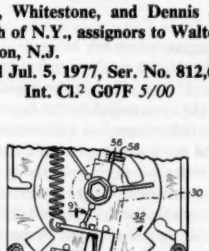
ANTI-SLUG MECHANISM FOR A COIN OPERATED DEVICE

Harry Greenwald, Whitestone, and Dennis J. Larkin, West Hempstead, both of N.Y., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Jul. 5, 1977, Ser. No. 812,638

Int. Cl.[2] G07F 5/00

U.S. Cl. 194—61 **4 Claims**



1. In a coin operated timing device of the type having a switch actuated timing motor; a star wheel; first transmission means associated with the timing motor and operable to rotatably drive the star wheel in a first angular direction when the timing motor is activated; a ratchet wheel mounted coaxially with the star wheel and being operable, in engagement with a switch, in a first rotary position, to activate the timing motor, and in a second rotary position, to deactivate the timing motor; the star wheel and the ratchet wheel, each bearing a projection at substantially the same distance from the coaxial mounting and which projections are operable to mutually abut, whereby rotation of the star wheel will rotatably drive the projection thereof into abutment with the projection on the ratchet wheel and thereafter cause the ratchet wheel to rotate conjointly with the star wheel in the first angular direction, driving the ratchet wheel into its second rotary position whereby the timing motor is deactivated; first driving means operable to rotatably drive the ratchet wheel in the first direction and into the first rotary position, thereby to increase the distance between the projections when measured in the first angular direction and to activate the timing motor; second driving means being rotatable; second transmission means comprising a coin carrying plate adapted to receive a predetermined sized coin and being operably connected between the first driving means and the second driving means; the second driving means being rotatable through a first predetermined angular distance and thereafter, when carrying the predetermined sized coin in the coin carrying plate, through a second predetermined angular distance; rotation of said second driving means in the first direction over its second predetermined angular distance being operable to drive the second transmission means and thereby to drive the first driving means in the first direction through an angular distance corresponding to the second angular distance; and an anti-coin return spring disposed for movement from a normal position in the path of travel of the coin to a displaced position out of the path of travel by the coin moving in the first angular direction and thereafter to return to its normal position upon passage of the coin beyond the spring to prevent the coin from moving in a second angular direction opposite to the first angular direction; wherein the improvement comprises:

an anti-slug mechanism including a stop carried on the anti-coin return spring and a projection carried on the second transmission means, said projection being driven into abutment with said stop as the second driving means is rotated through the first predetermined angular distance when the anti-coin return spring is in its normal position, thereby to restrict the maximum rotation of the second driving means; and

the anti-coin return spring carrying said stop out of the path of travel of said projection when the spring is moved to its displaced position thereby to allow the second driving means to rotate through the second predetermined angular distance.

4,128,157

COIN TESTING MECHANISMS

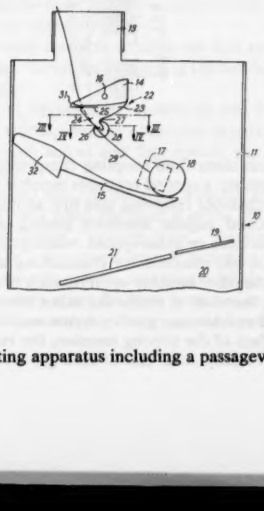
Michael I. Henville, Wembley, England, assignor to Mars, Inc., McLean, Va.

Filed Jul. 27, 1977, Ser. No. 819,596

Claims priority, application United Kingdom, Jul. 28, 1976, 31504/76; Sep. 27, 1976, 40065/76; Oct. 7, 1976, 41814/76

Int. Cl.[2] G07F 3/02

U.S. Cl. 194—97 R **19 Claims**



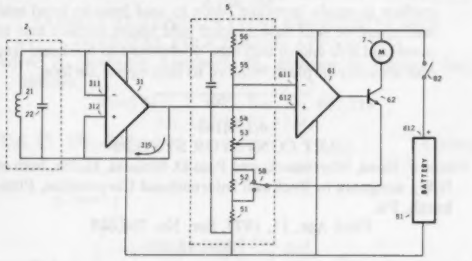
1. A coin-testing apparatus including a passageway defining

a path along which a coin inserted into the apparatus will travel; at least one wall defining one side of the passageway; means for examining the authenticity of a coin in the passageway and producing an acceptance signal if the coin is found to be acceptable; a resilient thread-catching device secured against the wall of the passageway to the inside of a bend in the coin path upstream of the position a coin reaches when the acceptance signal is first given, the thread-catching device comprising a thread-holding portion lying adjacent the wall surface but free to be flexed away from it, an entry portion adjoining the thread-holding portion and diverging from the wall towards its free outer end, the thread-holding portion having a protrusion extending toward the wall; and a member having a recess to receive the protrusion so that, when a thread attached to a coin which has moved along the coin path to a position downstream of the thread-catching device is tensioned and pulled upwardly, the tensioned thread will slip behind the entry portion and then into the recess and past the protrusion.

4,128,158
PRECISION COIN ANALYZER FOR NUMISMATIC APPLICATION

Joseph L. Dautremont, Jr., Northridge, Calif., assignor to Coin Cop Co., Glendale, Calif.

Filed Jul. 22, 1976, Ser. No. 707,891
Int. Cl.[2] G07F *3/02*
U.S. Cl. 194—100 A **6 Claims**



1. A method for the static testing of coins or other metallic objects whereby oscillating currents in the coil of an oscillator are coupled first to a standard or reference article and the amplitude of oscillations is compared to a direct current derived from the current measured by the indicator, for the purpose of setting the amplitude of oscillations to a reference level; the currents are then coupled to the article to be tested and any difference in losses causes a change in amplitude of said oscillations from the reference level which is compared to the changed direct current derived from the changed current measured by the indicator.

4,128,159
APPARATUS FOR FEEDING AND ORIENTING PARTS

William V. Pataki, 7399 Marywood Dr., Newburgh, Ind. 47630

Filed Dec. 22, 1977, Ser. No. 863,263
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—389 **12 Claims**

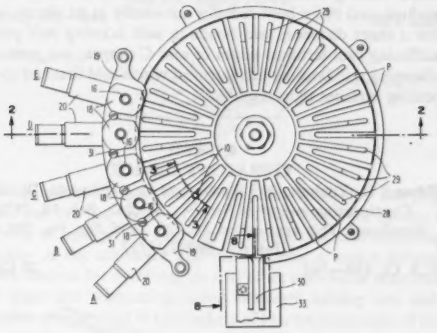
1. Apparatus for automatically orienting and feeding to a work machine elongated non-symmetrical parts having larger-diameter and smaller-diameter portions, said apparatus including:

a. an intermittenly rotatable indexing dial having a plurality of radial pockets;

b. a plurality of feed tubes, each tube adapted for carrying a plurality of randomly oriented non-symmetrical parts aligned end-to-end and for delivering said parts to the periphery of said indexing dial, the number of feed tubes being substantially smaller than the number of pockets in said indexing dial;

c. ejection means at the delivery end of each feed tube for selectively ejecting an individual part from a feed tube into a pocket of said indexing dial;

d. means in each pocket for effecting orientation of a part received therein; and

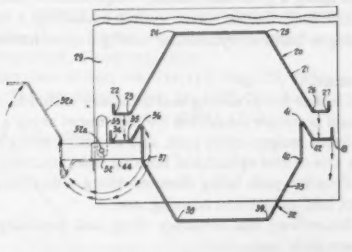


e. means for discharging said oriented parts from said pockets successively one at a time into a discharge track for feeding said oriented parts to a work machine.

4,128,160
LEAK FREE HOUSING FOR VERTICAL SCREW CONVEYOR

Douglas O. Deal, Bellevue, and Robert C. Morley, Sandusky, both of Ohio, assignors to Sam Stein Associates, Inc., Sandusky, Ohio

Filed Jul. 21, 1977, Ser. No. 817,714
Int. Cl.[2] B65G *65/46*
U.S. Cl. 198—657 **8 Claims**



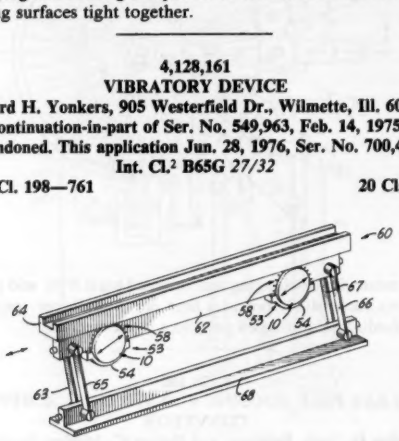
1. A generally vertical joint structure extending longitudinally of a housing enclosing a generally vertical screw conveyor having an axial driving shaft forming part of a larger machine; comprising a generally cylindrical housing composed of two hollow half portions, each generally C-shape in section; said half portions assembled with their open sides mutually meeting and joining along two longitudinal zones diametrically opposite in said housing and parallel to the axis of said conveyor shaft to form generally a cylinder whose axis coincides with said shaft axis; means closing the open top and bottom of said housing; said housing half portions consisting of formed sheet material; there being openings in said housing near the top and bottom thereof for inlet and outlet of material moved by said conveyor and said housing being otherwise imperforate; each of said longitudinal joints comprising, in a first of said half portions, a generally planar portion, at each terminal edge of said C-shape, parallel to said axis and extending a short predetermined distance beyond and essentially perpendicular to a diameter of said housing and there bent downwardly and outwardly at an acute angle extending linearly to approximately said diameter, thus forming a first linear sealing surface, and there bent radially outwardly at an obtuse angle for a short

distance; each of said longitudinal joints, in a second of said half portions, comprising at each terminal edge of said C-shape a linear portion extending at said above-mentioned acute angle to a zone approximately on said diameter outside of said first linear sealing surface, thus forming a second linear sealing surface, and there bent radially outwardly at an obtuse angle for a short distance; said bends in said housing half portion stiffening said terminal edges of said C-shapes; and means for clamping said housing half portions which said first and second sealing surfaces tight together.

4,128,161
VIBRATORY DEVICE

Edward H. Yonkers, 905 Westerfield Dr., Wilmette, Ill. 60091

Continuation-in-part of Ser. No. 549,963, Feb. 14, 1975, abandoned. This application Jun. 28, 1976, Ser. No. 700,462
Int. Cl.[2] B65G *27/32*
U.S. Cl. 198—761 **20 Claims**



4. In combination

guide means for defining the path of travel of objects positioned upon said guide means,

support means for resiliently supporting said guide means for movement of said guide means relative to said support means along a generally, planar reciprocative path,

a self-contained inertial drive system including a housing defining a hollow, cylindrical configuration having two ends,

an armature,

resilient means for mounting said armature within said housing, said armature supported for movement along a generally, linear reciprocative path, said armature being located on an axis of said cylindrical housing, said generally linear reciprocative path being directed along a diameter of an end of said cylindrical housing, and

means for moving said armature along said generally linear reciprocative path, and

means for rigidly mounting said self-contained inertial drive system to said guide means to thereby transmit the vibrations resulting from the reciprocative movement of said armature through said housing to said guide means, said inertial drive system mounting means further comprising means for angularly adjusting the mounted position of said cylindrical housing relative to said guide means thereby angularly adjusting said armature path relative to said guide means.

4,128,162
VIBRATORY OUTFEED

Paul N. Winberg, Fayetteville, N.Y., assignor to Lipe Rollway Corporation, Syracuse, N.Y.

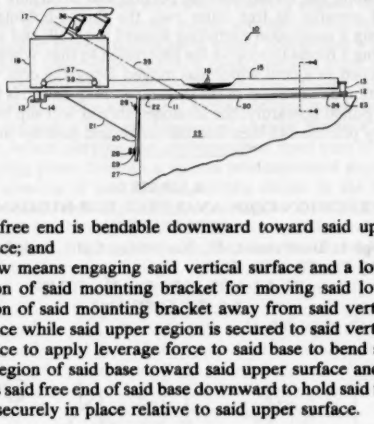
Filed Jul. 29, 1977, Ser. No. 820,368
Int. Cl.[2] B65G *27/00*
U.S. Cl. 198—763 **12 Claims**

1. A vibratory outfeed conveyor having a base, resilient means for mounting a feedstrip on said base, and a vibrator connected to said feedstrip for vibrating said feedstrip to outfeed objects, said conveyor comprising:

a. a mounting bracket connected with and generally perpendicular to said base and extending downward from said base;

b. means for securing an upper region of said mounting bracket to a vertical surface of a support element so that said base extends horizontally over an upper surface of said support element;

c. a free end of said base being supported above said upper surface of said support element by spacer means so that a midregion of said base between said mounting bracket and



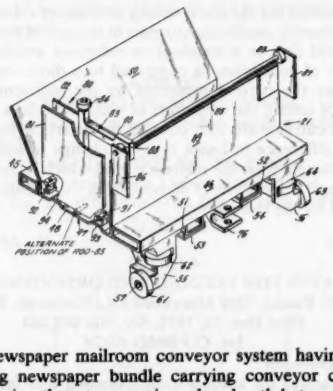
said free end is bendable downward toward said upper surface; and

d. screw means engaging said vertical surface and a lower region of said mounting bracket for moving said lower region of said mounting bracket away from said vertical surface while said upper region is secured to said vertical surface to apply leverage force to said base to bend said midregion of said base toward said upper surface and to press said free end of said base downward to hold said free end securely in place relative to said upper surface.

4,128,163
CART CONVEYOR SYSTEM

Victor F. Rana, Merrimack, and Paul D. Siniscal, Hollis, both of N.H., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 11, 1977, Ser. No. 786,645
Int. Cl.[2] B65G *17/00*
U.S. Cl. 198—796 **4 Claims**



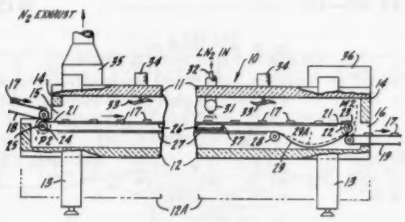
1. A newspaper mailroom conveyor system having means supporting newspaper bundle carrying conveyor carts and means causing them to move in a closed path between bundle loading and discharge stations, conveyor carts, and means defining loading and discharge stations at selected locations around the closed path, the system being characterized by having an improved conveyor cart comprising a bottom platform, a rear wall extending substantially vertically upwardly from said bottom platform, a front wall extending initially vertically upwardly from said bottom wall and then forwardly in a direction forming an acute angle between it and the plane of the bottom platform, pusher plate means defining a side wall substantially closing the space between said front and rear walls, means mounting said pusher plate whereby it can be

moved laterally from side to side of said bottom plate, said means for mounting said pusher plate for lateral movement comprises, rollers journaled on the lower end of said pusher plate means for rotation about axes that are oriented normal with respect to each other, the outer surface of one of said rollers riding in contact with the vertical portion of said front wall and the other of said rollers riding in contact against said bottom platform, and guide bar means extending across the transverse width of the conveyor cart and slidably engaged with said pusher plate means to insure smooth transverse movement of said pusher plate means from one side of the bottom platform to the other, means forming a part of said pusher plate means for engaging actuating cam surfaces located at the discharge stations of the conveyor system to move said pusher plate laterally and cause discharge of the newspapers carried in the conveyor cart, and selectively operable cam surfaces located at the discharge station to effect operation of said pusher plate means when desired.

4,128,164
CONSTANT-TENSION CONVEYOR DRIVE FOR THERMAL PROCESSING APPARATUS

Glenn A. Sandberg, Lockport, Ill., assignor to Formax, Inc., Mokena, Ill.

Filed Nov. 2, 1977, Ser. No. 847,719
Int. Cl.[2] B65G *23/44*
U.S. Cl. 198—813 **7 Claims**



1. A self-compensating, constant-tension conveyor drive system for a thermal processing apparatus of the kind comprising an elongated, insulated chamber which is normally maintained within a temperature range greatly different from ambient, a drive pulley at one end of the chamber, a tensioning pulley at the other end of the chamber, and an endless conveyor belt extending longitudinally of the chamber around both pulleys, the belt being appreciably longer than the spacing between the two pulleys to allow for substantial thermal expansion and contraction of the belt, the conveyor drive system comprising:

a main fluid pump, independently driven;

a fluid motor having an inlet port connected to the main pump, an outlet port, and a drive shaft connected in driving relation to the conveyor drive pulley;

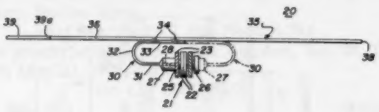
a rotary tension control pump driven from the tensioning pulley;

and a pressure-actuated flow control device connected to the outlet of the tension control pump to inhibit rotation of the tension control pump and the tensioning pulley by inhibiting output flow from the tension control pump until a predetermined tension is established in one run of the conveyor belt.

4,128,165
CHAIN CONVEYOR ASSEMBLY

Maynard R. Euverard, Williamsburg, Va., assignor to Velten & Pulver, Inc., Chicago Ridge, Ill.

Filed Jun. 27, 1977, Ser. No. 810,437
Int. Cl.[2] B65G *17/14*
U.S. Cl. 198—844 **25 Claims**

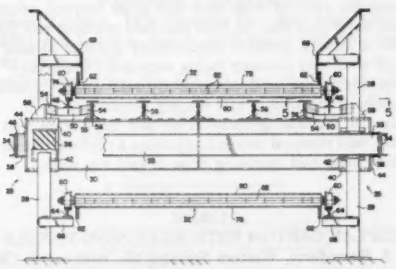


1. Apparatus for providing a support surface for carrying goods and the like on an articulated chain conveyor having a plurality of links joined together by connecting pins extending laterally of the conveyor and each having a socket formed axially therein for receiving an end of an associated wire rod, said apparatus comprising a rod structure having two ends respectively received in the sockets of two adjacent ones of the associated pins, said rod structure having a support portion overlying the chain in use and extending laterally therebeyond substantially parallel to the axes of the associated pins to provide a support surface, a plurality of said rod structures mounted on the chain providing a conveying surface for transporting articles.

4,128,166
ENDLESS BELT CONVEYOR SYSTEM

Lawrence H. G. Kovats, Mentor, Ohio, assignor to Mayfran, Incorporated, Cleveland, Ohio

Continuation of Ser. No. 718,111, Aug. 27, 1976, abandoned.
This application Oct. 31, 1977, Ser. No. 847,325
Int. Cl.[2] B65G *41/00*
U.S. Cl. 198—860 **15 Claims**



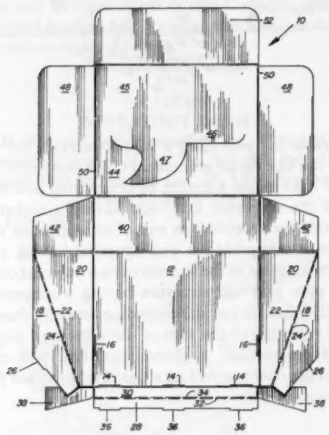
1. A conveyor comprising: an endless conveyor belt traveling along a conveyor track, a plurality of supports for said track and a plurality of sets of rubber shear blocks located between said track and each of said supports and acting in shear to resiliently support said track thereon, a first set of said rubber blocks acting in shear only in the lateral and vertical directions relative to the length of said conveyor and another set of said rubber blocks acting in shear only in the longitudinal and vertical directions relative to the length of said conveyor, the said plurality of rubber blocks, in combination, coacting to resiliently support the said track in the said lateral, longitudinal and vertical directions relative to the length of said conveyor.

4,128,167

SHIPPING AND DISPLAY CARTON FOR PLANTS AND THE LIKE

Rodney C. Hogshead, III, P.O. Box 366, Plymouth, Fla. 32768

Filed Jan. 16, 1978, Ser. No. 869,669
Int. Cl.[2] B65D *5/22, 5/52*
U.S. Cl. 206—44 R **15 Claims**



1. A shipping and display carton comprising:

a bottom wall;

a back wall joined to said bottom wall and substantially normal thereto;

opposing first and second side walls, each joined substantially normal to said bottom and back walls;

a top wall joined along one edge thereof to said back wall, said top wall having an inner face toward said bottom wall when said top wall is parallel thereto, and an outer face with a printed message thereon opposing said inner face, said top wall having first and second flaps along opposing edges thereof, which opposing edges are normal to said one edge of said top wall, said side flaps extending parallel to and in abutment with the corresponding one of said first and second side walls when said top wall is in a shipping position parallel with said bottom wall;

means permitting bending of the top wall along a line substantially parallel with said one edge thereof, whereby said outer face may be bent into two portions and folded into a display position substantially parallel to said end wall with said message facing outward therefrom;

means within the void designed by said walls for holding said bent top wall in said display position; and

means for facilitating removal of said flaps from said top wall, said removal means comprising a perforated tear line along each said opposing edge of said top wall.

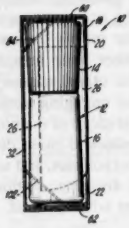
4,128,168

DISPLAY CARTON WITH RETAINING PANELS

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 4, 1977, Ser. No. 848,502
Int. Cl.[2] B65D *5/50*
U.S. Cl. 206—45.14 **11 Claims**

1. An improved display carton with retaining panels for an elongated bottle having at one end a cap, while the other end thereof is a closed based portion, the carton having front, back, and side panels arranged in a generally rectangular tubular configuration with end flaps closing the top and bottom ends thereof, and with the width of the carton being greater than the width of said cap, while the length of the carton substantially corresponds to the length of the elongated bottle, the improvement wherein said retaining panel structure is located at the top of said carton and inside the top closure flaps, said top retaining panel structure including a first flap hingedly connected to said back panel along the top edge thereof and lying on the inside of the top closure of the carton, a glue flap hingedly connected to said first flap and arranged horizontally on and secured to the inside of said first flap, with the glue flap being of smaller length than said first flap from front to back of



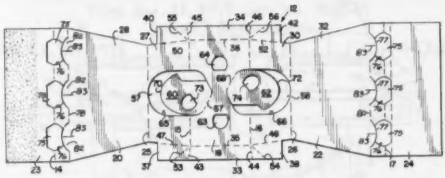
said carton, and two spaced, projecting tabs disposed on opposite ends of said glue flap and hingedly connected thereto, said projecting tabs being of sufficient length to form a right triangle with said first flap and the back panel thereby providing a central opening corresponding to the configuration of the cap of the elongated bottle, and adapted to receive same.

4,128,169

BOTTLE PACKAGE

Edwin L. Arneson, Morris, Ill., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Nov. 17, 1977, Ser. No. 852,287
Int. Cl.[2] B65D *75/14*
U.S. Cl. 206—141 **10 Claims**

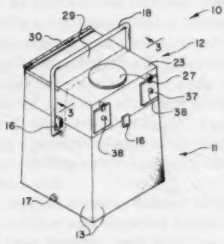


1. A package comprising an assembly of bottles arranged in double row transversely paired alignment and a tubular carton enclosing the bottle assembly which carton is formed from a single blank of foldable sheet material with a top wall forming panel, depending sidewall forming panels and connected bottom wall forming panels, which are wrapped about the top, sides and bottom of the bottle assembly, means formed, at least in part, in said bottom wall panels for restraining the bottom ends of the endmost bottles against outward movement, means associated with the top wall panel for restraining the top ends of the endmost bottles against outward movement, said top wall panel having a pair of openings which are in the central area in the direction lengthwise of said panel through which bottles may be removed without damaging the carton, said openings being spaced transversely of said top wall panel and extending on opposite sides of the carton, said top wall panel having finger accommodating openings spaced in the lengthwise direction of said top wall panel and finger hole reinforcing panels which are taken from the otherwise waste materials cut out to form the bottle removing openings in the top wall and which are hinged to the edges of the bottle removing openings and swung into position against the inside face of the top wall panel where they underlie at least portions of the panel area around the finger accommodating openings.

4,128,170
COMBINATION TACKLE BOX, BAIT HOLDER, COOLER AND SEAT MEANS

Charles Elliott, 6827 Radial Dr., Fayetteville, N.C. 28301

Filed Feb. 10, 1978, Ser. No. 876,675
Int. Cl.[2] A63D *55/00*; B65D *85/00*
U.S. Cl. 206—315 R 5 Claims

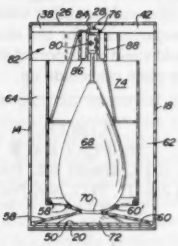


1. A combination fisherman's appliance comprising: a top loading type cooler means; a combination cooler closure means having a bottom portion adapted to meshingly engage and cover the open top of said cooler, side portions, a front portion, a rear portion, and a fixed partial top portion; a bait well wall extending between side portions and said top and bottom portions; an openable top portion hingedly disposed between said bait well wall and said rear portion whereby a bait well is formed with top access thereto being provided; drawer means slidingly disposed through said front portion and extending inwardly therefrom to a point adjacent the bait well wall whereby fishing tackle may be stored in said closure; and aperture means in said fixed top portion and said bottom portion providing access to the interior of said cooler without removing said cooler closure means.

4,128,171
PACKAGED LIGHT FIXTURE

Mark Evans, Thousand Oaks, Calif., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.

Filed Oct. 27, 1977, Ser. No. 845,993
Int. Cl.[2] B65D *85/30, 81/06*
U.S. Cl. 206—320 10 Claims

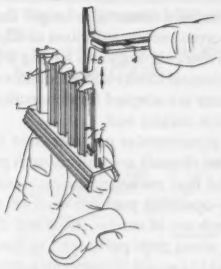


1. A packaged light fixture comprising:
(a) a container having a closable lid,
(b) a U-shaped liner which is channel-shaped in section, said liner being disposed within the container, a portion of said liner overlying a bottom of the container and a portion of oppositely disposed walls of the container,
(c) a lamp, a shade for said lamp, said shade surrounding said lamp and being spaced from the upright walls of the container by said liner,
(d) a shade support for supporting said shade from said lamp base, said shade support being separate from the shade and being disposed within said container,
(e) a removable brace overlying said shade and embracing the upper end of said lamp base to impede movement of said lamp base in a second transverse direction which is generally perpendicular to said first direction.

4,128,172
HOLDER FOR SHAVING UNITS

Michael F. Joyce, Reading, England, assignor to The Gillette Company, Boston, Mass.

Filed Sep. 26, 1977, Ser. No. 836,792
Claims priority, application United Kingdom, Sep. 28, 1976, 40093/76; Mar. 22, 1977, 12105/77
Int. Cl.[2] B65D *85/54*
U.S. Cl. 206—352 9 Claims

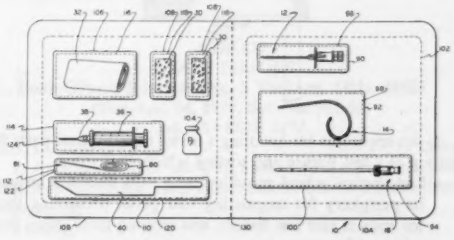


1. A dispenser and a shaving unit, said shaving unit having slide coupling means thereon for attachment to a razor handle, said slide coupling means comprising a pair of opposed grooves, said dispenser comprising a base portion, and elongated tongue means extending outwardly from a first surface of said base portion, said tongue means and said shaving unit being substantially normal to said base portion, said tongue means having a first end free and a second end fixed to said base portion and having parallel edges slidingly engaging said grooves, thereby releasably retaining said shaving unit thereon by frictional engagement of said tongue means edges with said grooves of said slide coupling means of said shaving unit.

4,128,173
PERITONEAL FLUID TREATMENT APPARATUS, PACKAGE AND METHOD

Harrison Lazarus, 1474 Penrose Dr., Salt Lake City, Utah 84103, and James A. Nelson, 1708 Forest Hills Dr., Salt Lake City, Utah 84106

Continuation of Ser. No. 626,323, Oct. 28, 1975, abandoned. This application Sep. 13, 1976, Ser. No. 722,752
Int. Cl.[2] A61B *19/02*; B65D *1/34*
U.S. Cl. 206—570 6 Claims



1. A peritoneal fluid treatment kit comprised of:
a first openable package having a bottom and a top which are substantially of similar shape and dimension sealed to each other about their perimeters to form an interior having a volume sized to receive contents, said top being

made of transparent material to permit viewing of the contents which are for peritoneal fluid treatment and which are positioned within said interior of said package, said contents including:

an intravascular catheter apparatus which includes a first cannula and placement means for inserting a portion of said first cannula into the peritoneal cavity of a patient,

a flexible guide means for insertion into the peritoneal cavity through said first cannula after removal of said placement means, said guide means being sized in cross-section to fit within said first cannula and in length to be substantially longer than said first cannula,

a second cannula which is flexible for insertion into the peritoneal cavity over said guide means after removal of said first cannula, said second cannula being sized in length to be substantially longer than said first cannula and in cross-section sufficient to allow said guide means to pass there through and having a first end to pass into the peritoneal cavity and a second end to which connector means are adapted for connection to parenteral fluid operation means; and

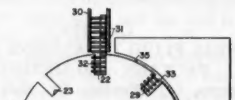
wherein said intravascular catheter, said flexible guide means and said second cannula are objects each positioned within the interior of said first package and each contained within their own separate openable package each of which has a bottom and a top which are of similar shape and dimension and sealed to each other about their perimeters to form an interior having a volume sized to receive its respective object therewithin, said top being made of transparent material to permit viewing of the respective objects and which is oriented within said first openable package for viewing through the top of said first openable package.

4,128,174

HIGH-SPEED INTEGRATED CIRCUIT HANDLER

Milo W. Frisbie, and Mavin C. Swapp, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1977, Ser. No. 772,696
Int. Cl.[2] B07C *5/344*
U.S. Cl. 209—573 **6 Claims**



1. An apparatus for handling a series of individual parts for testing at a test fixture and sorting which comprises:

a first vertical wheel provided with slots disposed arounds its periphery for singulating said parts, presenting them for tests at said test fixture, and moving them away from said test fixture; and

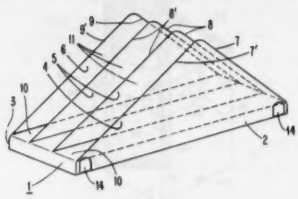
a second horizontal wheel for sorting said parts into a plurality of selected categories, said second wheel being positioned below said first wheel and having holes provided about its periphery for accepting said parts dropped from said first wheel.

4,128,175

STAND FOR HOLDING GRAMOPHONE RECORDS AND MAGNETIC TAPE CASSETTE CASES

Eduard H. Schweizer, 5101 Boarshead Rd., Minnetonka, Minn. 55343

Filed Dec. 13, 1977, Ser. No. 860,733
Claims priority, application Switzerland, Dec. 21, 1976, 16069/76
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—40 **4 Claims**



1. A multi-purpose stand for alternative storage of gramophone records encased in rectangular envelopes and tape cassettes encased in rectangular storage boxes, said stand being adapted for standing in at least two different positions on a flat surface, comprising:

a generally rectangular base plate provided with a plurality of parallel members projecting perpendicularly from one side of said base plate parallel to opposite edges thereof and defining together with said base plate one side compartment for the storage of gramophone records encased in rectangular envelopes when said stand is supported in a first position with said base plate one side up,

at least a portion of the outer edges of two of said members being in a coplanar relation and arranged to rest on a flat surface for supporting said stand stabily in a second position with the other side of said base plate up,

said base plate being provided with at least a pair of like rails extending perpendicularly from said base plate other side along at least a pair of opposite edges thereof,

the outer edges of said rails being in a coplanar relation and arranged to rest on a flat surface for supporting said stand stabily in said first position with said base plate one side up,

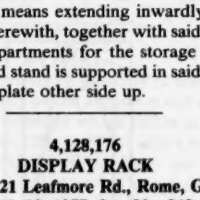
a plurality of rib means extending inwardly from said rails and defining therewith, together with said base plate other side, rack compartments for the storage of tape cassette boxes when said stand is supported in said second position with said base plate other side up.

4,128,176

DISPLAY RACK

Edward N. Green, 121 Leafmore Rd., Rome, Ga. 30161

Filed Jul. 22, 1977, Ser. No. 818,102
Int. Cl.[2] A47F *7/16*
U.S. Cl. 211—45 **8 Claims**



1. A display stand for displaying samples of carpet bound in

a book means, said book means having an upper edge, comprising:

a. a generally U-shaped base member having its open end disposed in a downwardly direction for contact with a flat surface;

b. a vertical member having its lower end affixed to the central portion of said U-shaped base member;

c. a pair of leg members affixed to said vertical member and extending outwardly therefrom in a plane intersecting the plane formed by said vertical member and said base member at essentially a right angle and in contact with said flat surface for maintaining said vertical member upright, each of said leg members including a first portion affixed to said vertical member intermediate the ends of said vertical member, each of said leg members further including a second portion, disposed at an angle to said first portion, for supporting a portion of said book means, each of said second portions flaring away from said vertical member to said flat surface; and

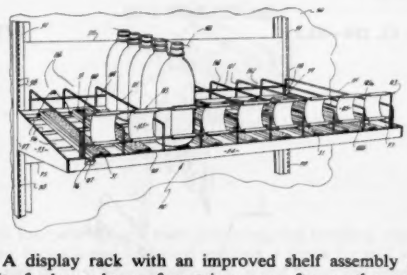
d. a horizontal support member affixed to the upper end of said vertical member and disposed essentially in the same place as said base member, said horizontal support member having a length approximately equal to that of the upper edge of said book means, said support member being provided with upwardly extending spaced apart hook members disposed transversely to said support member and adapted to receive the upper edge portion of said book.

4,128,177

DISPLAY RACK WITH IMPROVED SHELF ASSEMBLY

Rafael T. Bustos, Clarkston, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Oct. 21, 1977, Ser. No. 844,202
Int. Cl.[2] A47F 5/00
U.S. Cl. 211—49 D **6 Claims**



1. A display rack with an improved shelf assembly that gravity feeds a column of containers one after another to the front edge of a shelf as that column's lead containers are successively removed by a customer, said display rack comprising

a conveyor belt disposed at an angle relative to the horizontal, said conveyor belt sloping generally upward from the front edge of said shelf, each container in said column being positioned in generally vertical fashion on said belt during use of said rack,

a support floor disposed beneath said conveyor belt, said conveyor belt and said support floor cooperating to support said containers in said column on the upper surface of said belt,

the upper surface of said conveyor belt having a high coefficient of friction that inhibits movement on said belt of said containers relative one to the other, and at least one of said support floor and the under surface of said conveyor belt having a low coefficient of friction that allows movement of said belt over said support floor when said belt is at least partially loaded with containers and when not restrained against movement, said friction coefficients being related so that said belt can slide over said support floor while said containers remain generally stationary relative one to the other on said conveyor belt after removal of the column's lead container during use of said rack, and

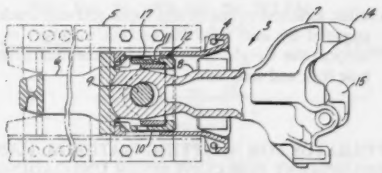
a bumper rail disposed adjacent the front edge of said shelf, said conveyor belt conveying all of said containers in said column forward together toward said bumper in response to gravity on the remaining containers in said column after removal of the lead container from said column, said conveyor belt and said container column being stopped by contact of the container in back of the lead container with said bumper rail, thereby positioning a new lead container adjacent the front edge of said shelf.

4,128,178

ROTARY TYPE RAILWAY CAR COUPLER

Kenneth L. DePenti, Mayfield Heights, and William J. Metzger, Willoughby, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Sep. 22, 1977, Ser. No. 835,579
Int. Cl.[2] B61G 9/00
U.S. Cl. 213—62 A **12 Claims**



1. A rotary-type coupler, comprising;

(a) a yoke with a longitudinal axis;

(b) a coupler head with a shank which is insertable longitudinally within the yoke;

(c) means for mounting the shank of the coupler head within the yoke for rotation about the longitudinal axis of the yoke, said means including a removable pin for holding the shank within the yoke;

(d) an opening disposed in the yoke and through which the pin is removed from the shank and yoke;

(e) a pair of opposing arcuately shaped grooves disposed in the yoke adjacent the opening;

(f) a pair of abutments disposed adjacent the pair of grooves;

(g) a retainer plate having opposing, arcuately configured sides which are insertable in the grooves by rotation of the plate;

(h) a stop carried by the retainer plate for engaging one of the pair of abutments to restrict rotation of the retainer plate in one direction; and

(i) means coacting with the retainer plate for engaging the other of the pair of abutments to restrict rotation of the retainer plate in a direction which is opposite said one direction, when the stop engages said one of the pair of abutments.

4,128,179

BALE LOADER

C. Keith Gilbert, Box 140, Rte. 1, Tonkawa, Okla. 74653

Filed Apr. 14, 1977, Ser. No. 787,469
Int. Cl.[2] E02F 3/72
U.S. Cl. 214—1 HH **17 Claims**

1. An apparatus for use with a standard tractor three point bale fork for lifting a hay bale onto the bed of a motor truck comprising:

a frame;

means for mounting said frame on said bed;

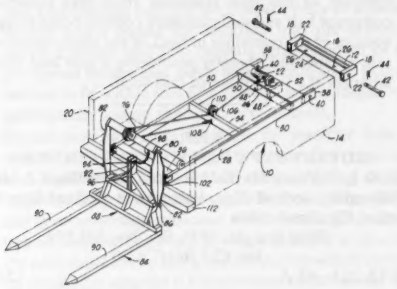
a boom pivotally attached to said frame;

a rigid connecting member having two ends, the first of which is pivotally attached to said boom and the second of which is pivotally attached to said bale fork;

means for controlling the angular position of said bale fork

relative to said rigid connecting member about the point of said pivotal attachment therebetween;

means for rotating said boom about said pivotal attachment to said frame to raise or lower said connecting member and said bale fork relative to said frame; and



a roller, attached to one of said frame and said truck, rollably engaged by said rigid connecting member, to partially support the weight of said rigid connecting member, said bale fork and said bale.

4,128,180

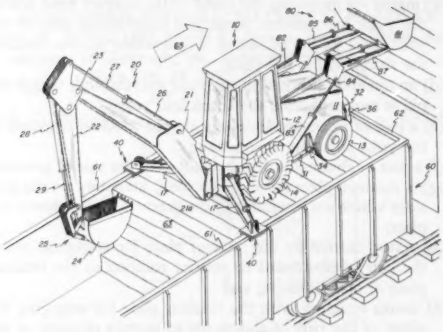
APPARATUS FOR ADAPTING MATERIAL HANDLING EQUIPMENT FOR CONTAINER UNLOADING AND METHOD OF USING

Donald Mellious, Box 266, Selkirk, N.Y. 12158

Filed Aug. 10, 1977, Ser. No. 823,280

Int. Cl.[2] B65G *67/24*

U.S. Cl. 214—44 A **15 Claims**



1. Apparatus for adapting a material handling equipment item for unloading open top containers,

said material handling equipment item having a tractor portion and at least a first material working portion;

said tractor portion having an undercarriage including frame, engine, axle, transmission, and rear housing members, means attached to said axle members for propelling said material handling equipment item across a surface, said tractor portion further having moveable stabilizer arms attached thereto;

said first material working portion having first and second pivotably connected arms connected to each other at a first end of each arm, a material grasping member pivotably connected to a second end of said second arm, a second end of said first arm being pivotably connected to said tractor portion, and means for causing relative motion between said arms, between said tractor portion and said first arm, and between said second arm and said material grasping member;

said open top container having end walls, and side walls;

said apparatus for adapting comprising:

a substantially smooth continuous skidplate member attached to said undercarriage and underlying said engine, axle, transmission, and rear housing members; and

first and second clamp members respectively attached to ends of a first and second of said stabilizer arms for engaging said side walls when said stabilizer arms are lowered.

8. A method of unloading an open top container having end walls and side walls by means of an item of self propelled material handling equipment having a tractor portion, first and second material handling members, a skidplate member underlying said tractor portion, and clamp members adapted to releasably engage said side walls comprising the steps of:

mounting said item of material handling equipment upon said open top container by the operation of the self propelling means of said item of material handling equipment;

stabilizing said item of material handling equipment upon said open top container by resting said skidplate upon material within said open top container and engaging said sidewalls with said clamp members;

removing a portion of said material from said open top container by operation of said second material handling member;

driving said item of material handling equipment to another position upon said open top container; and

removing another portion of said material from said open top container by operation of said second material handling member.

4,128,181

APPARATUS FOR LOADING AND COMPRESSING SOLID WASTE IN A BOX-LIKE STRUCTURE

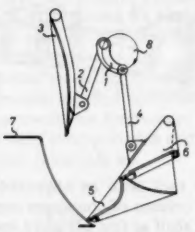
Mario Beronia, Rome, Italy, assignor to BAT Brevets et Applications Techniques S.A., Montreux, Switzerland

Filed May 19, 1977, Ser. No. 798,453

Claims priority, application Switzerland, May 28, 1976, 6691/76

Int. Cl.[2] B65F *3/00*

U.S. Cl. 214—83.3 **2 Claims**



1. Apparatus for loading and compressing solid waste in a box-like container mounted on a road vehicle for the collection and transportation of the waste, said container having spaced oppositely facing side walls and a rearward facing opening, said apparatus comprising:

a stationary inlet mounted in said opening in said container, said inlet having an inner end;

shaft means rotatably mounted on each side wall of said container;

means for rotating said shaft means;

supporting link means mounted to said shaft means for rotation therewith, said link extending between two peripheral points on said shaft means;

a lifting shovel disposed between and pivotably connected at one end to each side wall of said container, the bottom of said shovel comprising two concave sections meeting at a point approximately midway between said one end and the free end of said shovel, said first concave section being adjacent said one end of said shovel and said inner end of

said stationary inlet being closely adjacent said first concave section during operation of said apparatus;

a compression shovel disposed between and pivotably connected at one end to said container side walls, the free end thereof extending toward said lifting shovel;

first rod means having one end pivotably connected to one end of said supporting link at one of said peripheral points, the other end of said first rod being pivotably connected to said compression shovel at a location spaced from said one end thereof; and

second rod means having one end pivotably connected to the other end of said supporting link at the other of said peripheral points, the other end of said second rod being pivotably connected to said lifting shovel at a point spaced from said one end thereof;

whereby when said shaft means is rotated, said first and second rods and said lifting and compression shovels are caused to move in an oscillatory manner, said first concave section of said lifting shovel being curved in such a manner as to slide beneath and closely adjacent said inner end of said stationary inlet, said second concave section moving alternatingly toward and away from said opening in said container, said first and second rods being dimensioned and connected to said compression and lifting shovels in such a manner that said free end of said compression shovel substantially sweeps along said second concave section of said lifting shovel when said free end of said lifting shovel moves to the vicinity of said opening in said container.

4,128,182

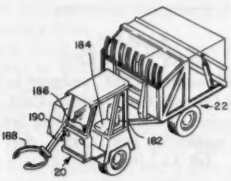
TRASH COLLECTING AND HANDLING VEHICLE

John W. Pickrell, 4206 N. 68th St., Scottsdale, Ariz. 85251

Continuation of Ser. No. 710,654, Aug. 2, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,207

Int. Cl.[2] B65F *3/02*

U.S. Cl. 214—302 **15 Claims**



1. A four wheel drive trash collecting and handling vehicle having: forward and rearward portions; a frame for said vehicle; a pair of front wheels connected to said frame and supporting said forward portion of said vehicle; a pair of rear wheels connected to said frame and supporting said rearward portions of said vehicle; said front wheels and said rear wheels both being pivotaliy steerable relative to each other; said frame comprising a front axle housing provided with a differential mechanism connecting said front wheels for driving the same and a rear axle housing provided with a differential mechanism connecting said rear wheels for driving the same; a first hydraulic motor for driving said differential of said front axle housing; a second hydraulic motor for driving said differential of said rear axle housing; an engine carried on said frame; a hydraulic pump means coupled to said engine; and said first and second motors being hydraulic motors coupled to said pump means to receive hydraulic fluid under pressure from said pump means; a driver's support and controls disposed at one side of said forward portion of said vehicle; a cab housing said driver's support and controls and having inner and outer sides; a container grasping and pickup means moveably mounted on said forward portion of said vehicle; actuating means on the end of an arm pivoted to said front portion at the inner side of said cab and projecting forwardly of said front portion, said pickup means including said arm; said actuating means disposed to move said container grasping means upwardly and backwardly toward said rearward portion of said vehicle; said actuating means being provided with means for moving said container grasping means so as to transfer a container from an upright position to a substantially upside-down position over said rearward portion of said vehicle; said rearward portion of said vehicle having supporting frame means for removably supporting a removable trash receiver in position to receive trash emptied from a container when moved upward and backward and upside-down by said container grasping and actuating means and further whereby said removable trash receiver is easily removed from said supporting frame means by lifting therefrom when said removable trash receiver is full.

4,128,183

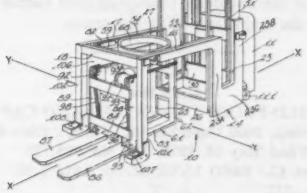
STRADDLE-TYPE LIFT TRUCK WITH A APPARATUS FOR HANDLING LOADS AT THE FRONT AND SIDES THEREOF

Thomas J. Finlayson, Palos Hills, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 16, 1976, Ser. No. 751,134

Int. Cl.[2] B66F *9/06*

U.S. Cl. 214—730 **2 Claims**



1. In a high-lift load-handling apparatus;

a mobile frame having spaced-apart side members with each side member having a forward vertical support leg, each leg being provided with mobile supports, said frame having a major axis and a minor axis;

support wheels operably connected to a respective one of said vertical support legs;

a mast structure having at least one extensible element carried by said frame;

a power actuator carried by said frame and operably connected to effect the controlled movement of said extensible element of said mast structure in an extending and retracting movement;

an operator carrier supported by said frame between said side members for vertical movement;

a vertically movable load elevator carrier by said extensible element of said mast structure to movement with it;

means on said load elevator engageable with said operator carrier to effect vertical movement of said operator carrier;

a load carrier supported by said load elevator for movement with said load elevator and for independent movement about a vertical axis and in a direction parallel to the major axis of said frame;

a load access opening defined by each of said frame side members and said forward vertical support legs also define between them a load access opening through which said load carrier can be moved in a load-engaging or load-depositing operation;

actuating means carried by said load elevator and operably connected to said load carrier for effecting the selective independent movement of said load carrier about a verti-

cal axis and in a direction parallel to the major axis of said frame;

an elongated guide means secured to said load elevator and extending in a direction parallel to the major axis of the apparatus;

slide means slidably engaged on said guide means;

slide power actuating means carried by said load elevator and operably connected to effect selective movement of said slide means relative to said guide means in either direction along said major axis;

a circular bearing cage secured to said slide means for movement with said slide means;

a drive ring gear rotatably supported in said circular bearing cage for selective rotation in either direction about a vertical axis;

antifriction bearings operably captured between said bearing cage and the external surface of said drive ring gear and operable to support said drive ring gear;

a ring gear power drive motor carried by said slide means of said load elevator and operably connected to effect rotation of said drive ring gear relative to said slide means; and,

means securing said load carrier to said drive ring gear;

whereby said drive ring gear can be rotatably driven to effect the movement of said load carrier to any desired angular position with respect to the major and minor axis of the apparatus and said slide can be moved with respect to the major axis of the apparatus to effect a desired positioning of the angularly positioned load carrier with respect to the major axis of the apparatus.

4,128,184

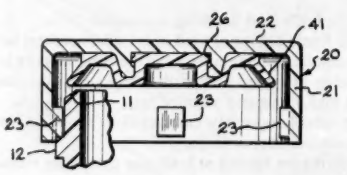
CHILD-PROOF CONTAINER AND CAP

John D. Northup, 2460 Underhill Rd., Toledo, Ohio 43615

Filed May 15, 1978, Ser. No. 905,750

Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—222 **2 Claims**



1. A child-proof container and closure combination comprising, a vial having an open end defined by an outwardly tapered surface having an angle of taper of 55° or less to the longitudinal axis of the container, a closure comprising a body having an upper panel spanning the vial opening and depending side walls for attachment to the vial, a peripheral series of retaining elements on the vial spaced axially from the tapered sealing surface thereof, said retaining elements having notches therein, a peripheral series of lugs on the interior side wall surfaces of the closure corresponding in spacing and number to said notches and cooperating therewith to form a closure which requires both an axial and rotational movement for release of the closure from the vial, a separate seal element retained within the closure and spanning at least the vial opening, said seal element having a resilient tapered sealing fin integral therewith and extending downwardly and outwardly at an angle from 10° to 20° less than the angle made by said vial sealing surface and being brought into sealing position by the seating of said lugs in said notches to form a seal that is "tight" or "well-closed" by industry standards and being held in said sealing position by the resiliency of said fin.

4,128,185

CONTAINER CLOSURE

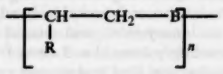
Walter R. Wszolek, Sykesville, Md., assignor to W. R. Grace & Co., New-York, N.Y.

Division of Ser. No. 756,934, Jan. 5, 1977, Pat. No. 4,077,935, which is a division of Ser. No. 563,018, Mar. 28, 1975, Pat. No. 4,020,966. This application Nov. 7, 1977, Ser. No. 849,384

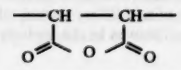
Int. Cl.[2] B65D *45/10;* **C08K** *5/04;* **B65D** *53/04, 59/06*

U.S. Cl. 215—349 **2 Claims**

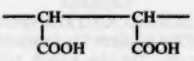
1. A container closure comprising a cap having deposited therein a resinous mass functioning as a gasket to seal the container when the closure is in sealing relationship with the container, said resinous mass comprising a fluxed plastisol of a composition comprising (a) a copolymer resin of a normal α-olefin and maleic anhydride (1:1 mole ratio) having a particle size in the range of from about 0.1 to about 1500 microns and having the structure



wherein B is a member of the group consisting of



and



R is H or C_xH_{2x+1}, x is 1 to 16 and n is 2–300, and (b) about 65 to 600 parts by weight of a polyester plasticizer per 100 parts by weight of the copolymer resin.

4,128,186

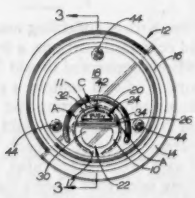
EASY OPEN END

Gordon R. Gane, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 838,184, Sep. 30, 1977, abandoned. This application Dec. 7, 1977, Ser. No. 858,317

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—268 **29 Claims**



1. An easy open container component comprised of panel means and a depressible tab provided with a primary section and a primary hinge portion formed integrally with said primary tab section and the panel means, said tab further including a secondary section formed integrally with the primary tab section and a selectively weakened secondary hinge portion that runs substantially fully across and connects the secondary tab section to said primary tab section, said primary and secondary tab sections being fully severed from and selectively overlapped by said panel means except in the area of said primary hinge portion, sealant material covering the underside of said panel means at least in the area of severance of said primary and secondary tab sections for effecting a seal between said severed panel means and tab sections whereby the opera-

tor can apply a force either simultaneously to both tab sections or only to the secondary tab section in order to obtain an initial separation of the panel means and tab and a subsequent pivoting of the entire tab as a unit about the primary hinge portion to the extent desired.

4,128,187

SECONDARY BARRIER CONSTRUCTION FOR LOW TEMPERATURE LIQUIFIED GAS STORAGE TANK CARRYING VESSELS

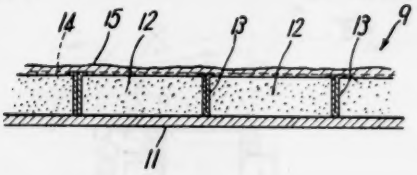
Tomiyasu Okamoto; Tsunanori Nishimoto; Kaoru Sawada; Koji Hayakawa, and Tomomichi Kurihara, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Sep. 23, 1976, Ser. No. 725,979

Claims priority, application Japan, Oct. 2, 1975, 50-135606[U]

Int. Cl.² B65D *25/18, 7/22, 25/00*

U.S. Cl. 220—464 **2 Claims**



1. A secondary barrier construction for a hold plate of a vessel having a hull including a tank supporting deck carrying a spherical low temperature liquified gas storage tank, said hold plate forming the inner shell of the hull and being of concave multi-surface construction and extending adjacent to the lower outer wall surface of the spherical storage tank up to the tank supporting deck;

heat insulating block plates of rigid urethane foam synthetic resin secured to said hold plate with joints between adjacent block plates;

heat insulating filling members placed in said joints and extending to said hold plate, said heat insulating filling members comprising single kraft paper-faced fiber glass folded to form a bent end and a pair of adjacent layers, said bent end extending to said hold plate and said adjacent layers being bonded to the opposed lateral surfaces of said block plates;

and a liquid tight, pressure resistant protective coating formed on the entire outer surface of said block plates and filling members, said protective coating consisting of an adhesive agent applied to the entire outer surface of said block plates and filling members, glass mesh applied to said adhesive agent, and an adhesive layer applied to the top of the glass mesh.

4,128,188

PILL DISPENSER

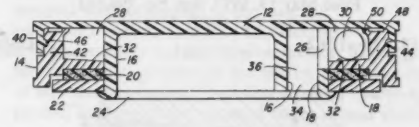
Leonard A. White, Gurnee, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 717,311, Aug. 24, 1976, abandoned. This application Nov. 30, 1977, Ser. No. 855,653

Int. Cl.² B65D *83/04*

U.S. Cl. 221—91 **23 Claims**

1. A pill dispenser which comprises: a pair of relatively rotatable members for sequentially dispensing a different pill in response to the relative rotation of one member to each of a plurality of different angular positions relative to the other member; and means for normally preventing relative rotation between said members in both rotational directions and for enabling said relative rotational movement only in response to axial forces applied to said members in opposite axial directions, said means preventing rotation comprising a spring biasing said members toward each other, whereby axial forces



applied to said members in opposite axial directions can overcome enough of said spring bias to enable relative rotational movement of said members.

4,128,189

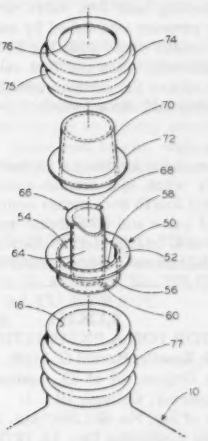
DEVICE FOR IMPROVING THE POURABILITY OF FLUIDS AND ALSO FORMING AN IMPROVED CLOSURE FOR A CONTAINER OF SUCH FLUIDS

Ernest W. Baxter, Van Wert, Ohio, assignor to National Plastics Corporation, Fort Wayne, Ind.

Filed Apr. 4, 1977, Ser. No. 784,287

Int. Cl.² B65D *25/42*

U.S. Cl. 222—109 **6 Claims**



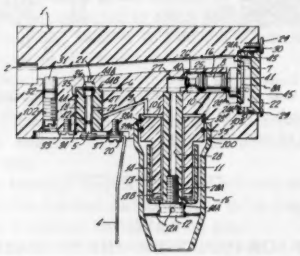
1. In combination with a container having an externally threaded open end, an insert for such containers to promote the dripless dispensing of semi-viscous liquids such as oil, syrup, and the like, comprising a circular flange adapted to bear sealingly against the open end of the container, and an integrally related annular well proportioned to fit within the container and disposed below the open end of the container and including means forming a drainage opening within the base thereof, and a pouring spout formed from a reverse bend within said well integrally related to said insert, and extending substantially above the circular flange and having a pouring lip disposed diametrically from said drainage opening and with a sharp pouring edge which contributes to dripless pouring from the interior of the container through said spout and providing a run-back surface leading to said well where the fluid is returned to the interior of the container at the level of said well, and a screw-on cap threadedly received over the threaded exterior at the open end of said container and including a shoulder adapted to exert clamping effort against the pouring edge and which clamps the circular shoulder of said insert sealingly against the open end of the container and prevents pouring out of said spout until said cap is removed.

4,128,190

POST MIX SOFT DRINK DISPENSER

Vincent A. Gruber, 515 E. Washington St., Rochester, Pa. 15074

Filed May 13, 1977, Ser. No. 796,542
Int. Cl.[2] B67D *5/56*
U.S. Cl. 222—129.2 **15 Claims**



1. A dispenser comprising;
a body,
first and second valves in said body,
first bore means for applying a first fluid to each of said valves to established pressure thereat to maintain said first and second valves in a first position,
means for moving said first valve to a second position against the pressure established by said fluid,
second bore means communicating between said first and second valve only when said first valve is in said second position to relieve the pressure established at said second valve wherein said second valve moves to a second position,
nozzle means,
third bore means for applying a second fluid to said nozzle means only when said second valve is in said second position, and fourth bore means communicating between said second valve and said nozzle means only when said second valve is in said second position wherein said first and second fluids are mixed together in said nozzle means.

4,128,191

COLLECTOR FOR A PNEUMATIC DISPENSER

Roland J. Frase, Roselle; Harold G. Meitl, Darien, and Tom M. McNaull, La Grange, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 681,306, Apr. 29, 1976, Pat. No. 4,091,968. This application Oct. 19, 1977, Ser. No. 843,469
Int. Cl.[2] G01F *11/24*
U.S. Cl. 222—167 **12 Claims**

1. In a pneumatic material dispenser having a housing, a rotary member disposed within the housing for carrying material on its periphery, a collector within the periphery of said rotary member having a plurality of axially spaced discrete material collection passages having first openings near the periphery of the rotary element for gravitationally receiving material dropped from said rotary member, a plurality of discharge tubes in exclusive fluid communication respectively with each of the collection passages and having distal ends, and air supply means for delivery of air into the collection passage ends of said discharge tubes at a higher pressure than said distal ends to propel the material therethrough, the improvement wherein said collection passages have second openings downstream from said first material collection openings, said second openings opening transversely of said collector, said air supply means comprises a plenum chamber disposed within said housing adjacent said collector for receiving air from a source of pressurized air, and air passage means establishing communication between said plenum chamber and said collection passages at said second openings.

4,128,192

THROW-AWAY CAN WITH INTEGRAL CLOSURE AND PULL-UP SPOUT

Stanley W. Coryell, Arlington, Tex., assignor to Classic Chemical, Grand Prairie, Tex.

Filed Jun. 8, 1977, Ser. No. 804,571
Int. Cl.[2] B65D *47/28*
U.S. Cl. 222—525 **3 Claims**

1. A throw-away one-time can for liquid additives for motor-vehicle fuel tanks and the like has a body having a top which includes a circular opening having an upstanding peripheral lip for receiving a circular cross-section closure element adapted to snap removably into said opening, said closure element including a depending integral spout which extends almost to the bottom of said can, said closure element and depending spout comprising:
a. an annular plug portion on the underside of said closure element, said plug portion having a lower annular downwardly-inwardly inclined surface and an upper annular upwardly-inwardly inclined surface, the maximum outside diameter of said plug portion being somewhat larger than the diameter of said opening in said can top;
b. an enlarged-diameter portion above and integral with said plug portion, the outer portions adapted to rest on said can top when said closure element is snapped into position, said enlarged-diameter portion having an annular recess which extends upwardly just above said upwardly-inwardly inclined surface for receiving and closely confining the upstanding peripheral lip of said top opening when said closure element is snapped into position with said spout extending downwardly through said top opening;
c. a pull-up ring above and concentric with said enlarged-diameter portion, said pull-up ring being integrally connected with one side only of said enlarged-diameter portion and adapted, in response to an upward pull applied to

said ring, to lift initially said one side only of the enlarged-diameter portion, thereby to open said confining recess and allow said upwardly-inwardly inclined surface to cam said lip radially outwardly, whereby a continued or subsequent upward pull on said ring removes said closure element from its snapped-in position;

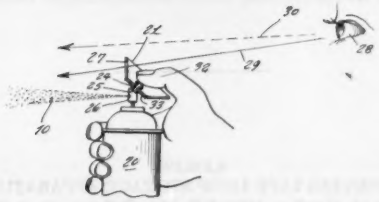
d. said spout being a hollow cylindrical body integral with and depending from said annular lower inclined surface of said plug portion.

4,128,193

PRESSURIZED COATING CONTAINER WITH DEPTH OF COLOR INDICATOR

James Nighswonger, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jun. 30, 1977, Ser. No. 811,693
Int. Cl.[2] B65D *83/14*; B05B *11/00*
U.S. Cl. 222—402.21 **1 Claim**



1. An applicator device comprising in combination:

a pressurized container of the hand held, sprayer type having a photochromic coating material therein;

said coating material being of a type wherein depth of color produced due to light thereon, when applied to a substrate, varies with the thickness of coating;

a movable indicator of a color matching said color produced and graduated in intensity between limits matching those applicable to the coated substrate; and

said indicator being mounted on said container and disposed in the line of operator vision when the container is in functional coating position;

whereby said operator simultaneously views both the selected indicator intensity and the depth of color produced on said substrate which is due to the effect of light the quantity of said coating material being applied.

4,128,194

CARRYING APPARATUS DETACHABLY MOUNTABLE ON CLOTHING AND OTHER FABRIC-LIKE MATERIALS

Gerhardt J. Hinz, McCord Apartments, #13, Denison, Iowa 51442

Filed Apr. 28, 1975, Ser. No. 572,416
Int. Cl.[2] A45C *1/04*
U.S. Cl. 224—5 R **4 Claims**

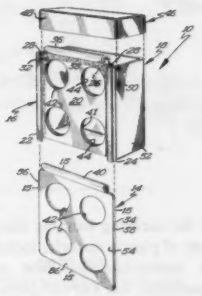
1. In combination with a flexible, fabric-like material having obverse and reverse sides, a carrying apparatus attachable to and detachable from said flexible, fabric-like material without damage to the integrity of said material, comprising:

a tongue member positionable wholly on the reverse side of said material and having a periphery engageable against the reverse side of said material;

a receiver member engagable against the obverse side of said fabric-like material opposite said tongue member and including means for encompassing at least part of the periphery of said tongue member to releasably retain said tongue member adjacent said receiver member in a retained position wherein said receiver member cooperates with said tongue member to define a narrow gap therebetween in which said fabric-like material is captured, permitting said members to be releasably attached to the fabric-like material so as to be firmly retained on the material without damage to the material;

a load device carried by one of said members;

said tongue member and said receiver member having generally rectangular peripheries and said encompassing means of said receiver member including a pair of spaced-apart, parallel tracks adjacent opposed edges of said receiving



member for slidably receiving said tongue member in said tracks;

a keeper on said receiver member positioned between said parallel tracks to receive and releasably engage said tongue member; and

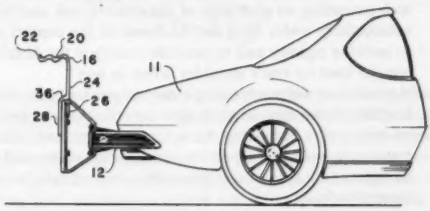
said tongue member including a rib confronting and releasably engaging said keeper to thereby releasably lock said tongue member within said keeper, with said fabric-like material being retained between said rib and said keeper.

4,128,195

EMERGENCY BUMPER AND BIKE RACK

Melvin Collins, 907 Meadbrook St., Carson, Calif. 90746

Filed Apr. 29, 1977, Ser. No. 792,420
Int. Cl.[2] B60R *9/10*
U.S. Cl. 224—42.03 B **2 Claims**



1. A rack mountable on the bumper of an automotive vehicle, said rack comprising

a first frame for clamping onto the bumper of a vehicle, said first frame including two vertical members interconnected by two horizontal members, part of the vertical members being formed to conform to the bumper and being provided with hook bolts and associated fasteners to secure said first frame to the bumper; and

a separate second frame slidably mounted on the first frame and extending upwardly therefrom, said second frame being adapted to carry a bicycle, said second frame comprising a pair of substantially parallel substantially U-shaped frames having adjacent open ends with one frame overlapping the other, said U-shaped frames being connected to each other with a distance therebetween, one of said U-shaped frames having a closed end provided with more than one member extending therefrom transversely

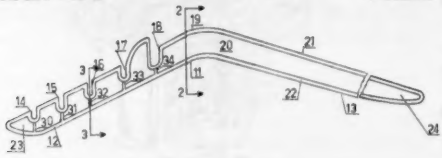
to the plane of said frame, said members having bumps formed therein for retaining a bicycle thereon.

4,128,196

DEVICE FOR CARRYING HANGING CLOTHES

Edward J. Hill, 1515 David Whitney Bldg., Detroit, Mich. 48226

Filed Sep. 8, 1977, Ser. No. 831,490
Int. Cl.[2] A45C *13/26*
U.S. Cl. 224—45 T **7 Claims**



1. A device for carrying hanging clothes, comprising:

a central web of plastic material including a curved portion integrally interconnecting first and second generally straight portions, the curved portion being adapted for placement over one's shoulder when using the clothes carrying device such that the first and second portions extend downwardly from the horizontal at acute angles, the first portion being adapted to extend rearwardly from one's shoulder and having a plurality of recesses along its top surface for receiving the hooks of clothes hangers, or the like, the second portion being adapted to extend forwardly from one's shoulder and to be hand-gripped;

a first transverse web of plastic material integral with and generally perpendicular to said central web and extending along the top surface of said first, second, and curved portions and along the peripheriphy of said recesses for reinforcement;

a second transverse web of plastic material generally perpendicular to and integral with said central web and extending along the bottom surface of said first, second and curved portions for reinforcement; said second transverse web extending to each side of the central web and being substantially wider than the thickness of the central web to provide rigidity and to provide a surface for distributing the load on one's shoulder when in use;

said transverse webs extending along substantially the entire lengths of said first, second, and curved sections; and

reinforcing ribs extending between the first and second transverse webs at the bottom of each said recess, said ribs being on each side of and generally perpendicular to said central web.

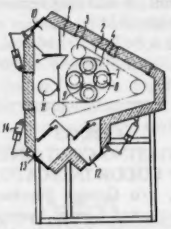
4,128,197

DEVICE FOR REMOVING FLASH FROM MOULDED RUBBER ARTICLES

Vitaly G. Ischenko, bulvar Profsojuzov, 26, kv. 193; Vladimir A. Shvetsov, ulitsa Gorkogo, 12, kv. 13; Evgeny N. Erygin, Prospekt Lenina, 93, kv. 53, all of Volzhsky Volgogradskoi oblasti, and Roman L. Girshik, Sokolnichesky val, 24, korpus 2, kv. 139, Moscow, all of U.S.S.R.

Filed Oct. 20, 1977, Ser. No. 843,820
Int. Cl.[2] B26F *3/00*; B29H *3/06*
U.S. Cl. 225—97 **2 Claims**

1. A device for removing flash from molded rubber articles comprising: a pressuretight heat-insulated casing; an endless perforated belt accommodated in said casing; driving sprockets around which said endless belt is driven; a workpiece holding zone defined by said belt running around said driving sprockets; brushes for mechanical removal of flash arranged rotatably across the movement of said belt; shafts on which said brushes are supported; rotatable discs arranged on both sides of said



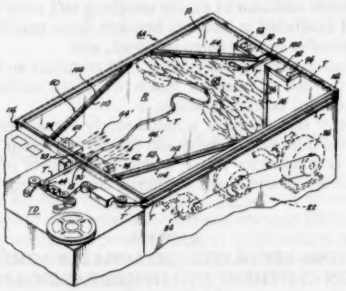
workpiece holding zone and on which said shafts are supported.

4,128,198

ENDLESS TAPE LOOP STORAGE APPARATUS

George M. Woodley, 14200 NE. 21st., Bellevue, Wash. 98007

Continuation of Ser. No. 654,199, Feb. 2, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 813,092
Int. Cl.[2] B65H *17/32, 75/00*
U.S. Cl. 226—97 **15 Claims**



1. In an endless tape loop storage apparatus of the type having a generally horizontally disposed storage receptacle for tape being driven by and returned to a tape drive mechanism, such as for storing a loop of magnetic tape or the like when driven at high speed by the capstan drive means of a conventional audio tape recorder transport deck or the like, and wherein such storage receptacle is defined by a generally horizontal top plate, a generally horizontal bottom plate, a front wall defining an entrance slot through which the tape passes from the drive mechanism into the receptacle, a rear wall defining an exit slot through which the tape emerges from the receptacle for return thereof to the drive mechanism, and two side walls, with air jet delivery means being associated with said entrance and exit slots and directed to assist the flow of the tape into and out of the receptacle, the improvement comprising:

(a) two relatively high velocity, low volume air jet delivery means closely spaced at opposite sides of said entrance slot and directed into the receptacle in a direction generally away from the front wall and delivering air at a velocity substantially exceeding the velocity of the tape and thereby moving the tape through said entrance slot and into the receptacle at high speed without mechanical contact therewith;

(b) two relatively low velocity, high volume air jet delivery means situated adjacent said front wall and placed approximately equidistant between the entrance slot and the respective side walls, and directing air streams into the receptacle in a direction generally away from the front wall and thereby causing the tape entering the receptacle to become arranged in long serpentine folds on edge in the generally central region of the receptacle; and

(c) a plurality of air exhaust apertures in at least one of said top plate and said bottom plate in the region(s) thereof overlying and underlying the serpentine folds of the tape in the receptacle, and through which air can exhaust freely, thus influencing the direction and velocity of air flow inside the receptacle to maintain the bulk of the stored tape concentrated in said generally central region.

4,128,199

Patent Not Issued For This Number

4,128,200

LIVESTOCK GUIDE AND MANIPULATOR

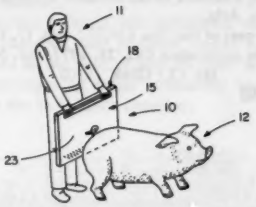
Robert W. Jones, Mt. Pulaski, Ill., and Wesley E. Jones, R.R. 1, Chestnut, Ill. 62518, assignors to Wesley E. Jones, Chestnut, Ill.

Filed Nov. 24, 1976, Ser. No. 744,728

Int. Cl.[2] B68B *11/00*; A22B *3/06*; A01K *29/00*

U.S. Cl. 231—2 E **1 Claim**

1. A livestock guide and manipulator comprising a hand carried and manipulated panel body having a lateral panel face to block the view and passage of livestock when positioned adjacent thereto for guiding said livestock, said lateral panel face comprising a large surface many times wider than the thickness of said body, a gripping handle means along one edge of said body to provide means whereby an operator can grasp said body for manipulation thereof, two or more electrodes on said face of said panel projecting from the panel face adjacent the edge thereof opposite said handle means, a high voltage producing means attached to said panel and electrically connected to said electrodes to provide a high voltage electrical potential between certain ones thereof when actuated, and means for selectively actuating said high voltage means



whereby livestock will be electrically shocked by said electrodes engaged therewith to urge said livestock for the manipulation thereof.

4,128,201

SYNCHRONIZING MEANS

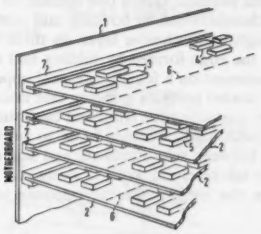
Iann M. Barron, Redbourne, and David J. Wheeler, Cambridge, both of England, assignors to Computer Technology Limited, London, England

Filed Sep. 21, 1976, Ser. No. 725,298

Claims priority, application United Kingdom, Nov. 5, 1975, 45908/75

Int. Cl.[2] G06F *11/00*

U.S. Cl. 235—304 **4 Claims**



1. Synchronising means for synchronising with a periodically repeating reference signal the change of level of an input signal capable of assuming either one of a first and second level, comprising a source of said periodically repeating reference signal, a source of said input signal, a bistable device having first and second inputs and an output and capable of assuming a first stable state in response to the first level of input signal applied to said first input and of assuming a second stable state in response to the second level of input signal applied to said first input and enabled periodically by said reference signal applied to said second input to respond to the level of the input signal, said bistable device producing at said output an output signal having a first level representing said first stable state and a second level different from said first level and representing said second stable state, means responsive to a level of output signal intermediate said first and second levels representing an unstable condition of said bistable device, resulting from a level of input signal intermediate said first and second levels of input signal during the period the bistable device is enabled to respond, to generate a stop signal and means for applying said stop signal to said source of periodically repeating reference signal to interrupt the reference signal at a predetermined point in its periodicity and before the bistable device is next enabled, until the bistable device assumes a stable condition.

4,128,202

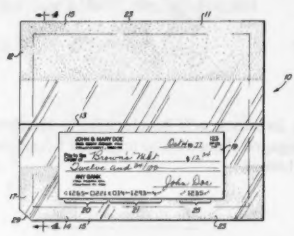
DOCUMENT CARRIER

Melvin S. Buros, Phoenix, Ariz., assignor to Micr-Shield Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 614,332, Sep. 17, 1975, Pat. No. 4,060,711. This application Oct. 21, 1977, Ser. No. 844,274

Int. Cl.[2] G06K *19/00*

U.S. Cl. 235—493 **9 Claims**



1. A document carrier for enclosing a document to be machine-processed, said document having a front and back surface, said carrier comprising:

a. a flat substantially rectangular sheet of foldable material having a layer of cohesive material on one surface thereof, said layer of cohesive material capable of adhering only to a similar layer of cohesive material;

b. said sheet being sufficiently translucent or transparent to permit optical recognition of the information on the front and back surface of said document when said document is placed on the cohesive side of said sheet and said sheet is folded over said document to enclose said document;

c. said sheet, when folded, having upper and lower cohesively coated portions facing one another to enclose said document therebetween by bonding said portions to each other through said cohesive layer on three sides of said document, the edge formed by folding said sheet enclosing said document on a fourth side, said upper and lower cohesively coated portions gripping said document therebetween by contacting the front and back surfaces of said document with said cohesive layer to prevent relative movement between said document and said sheet; and

d. a magnetic ink-receiving surface along one edge of said material on the surface thereof opposite said cohesive material.

4,128,203

FOUR-PORT THERMALLY RESPONSIVE VALVE

Edgar W. Maltby, Elgin, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 1, 1977, Ser. No. 830,001

Int. Cl.[2] G05D *23/275*

U.S. Cl. 236—100 **11 Claims**

1. A thermally responsive device for valving two pairs of fluid ports, comprising:

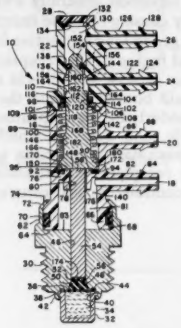
(a) a housing means defining a fluid chamber, said housing means further defining first, second, third and fourth fluid ports communicating with said fluid chamber;

(b) valve means disposed within said fluid chamber, said valve means including:

(i) means defining a first valve seat in said housing means and located intermediate said first and second fluid ports, said first valve seat is defined by an annular surface of said housing means and disposed within said fluid chamber;

(ii) means defining a second valve seat in said housing means and located intermediate said third and fourth fluid ports;

(iii) a valve member disposed within said fluid chamber, said valve member being movable between a first and second position and having first and second spaced seal means thereon, said first seal means comprising a resilient annular member mounted on said valve member and movable therewith, in which first position said first seal means seals against said first valve seat for isolating said first and second fluid ports from each other, and in which second position said first seal means is spaced from said first valve seat for communicating said first fluid port with said second fluid port wherein, upon movement of said valve member between said first and second positions, said second seal means is moved between a position sealing against and a position spaced from said second valve seat;



(c) means disposed within said fluid chamber and cooperating with said valve member for isolating said first and second fluid ports from said third and fourth fluid ports, irrespective of the position of said valve member;

(d) means biasing said valve member to said first position; and

(e) thermally responsive means associated with said housing means and including means operative to move said valve member between said first and said second positions in response to predetermined temperatures.

4,128,204

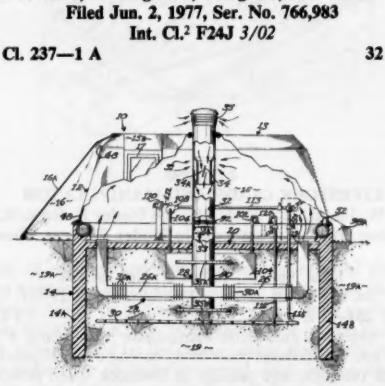
INHABITABLE ENCLOSURE AND METHODS RELATING THERETO

Glenn C. Wade, 313 Highland, Paragould, Ark. 72450

Filed Jun. 2, 1977, Ser. No. 766,983

Int. Cl.[2] F24J *3/02*

U.S. Cl. 237—1 A **32 Claims**



1. An enclosure suitable for human habitation, said enclosure comprising:

foundation means comprised of thermally insulative material for dividably defining an underground geothermal heat exchange region substantially separate from surrounding ground;

shelter means for enclosing an internal living space, said

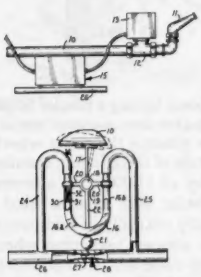
shelter means adapted to be disposed upon said foundation means;
geothermal heat exchanger means disposed within said separate heat exchange region for exchanging heat between said region and said shelter;
fan means for circulating air between said geothermal heat exchanger means and said shelter living space to thereby control internal shelter temperature;
blind means selectively deployable in sunlight admitting and sunlight reflecting positions to thereby facilitate selective internal solar energy use;
transulucent shield means disposed under said blinds for preventing foreign material from entering said shelter; and
liquid anchor means for securing said shelter to said foundation.

4,128,205

WIND CORRECTION METHOD AND APPARATUS FOR IRRIGATION SYSTEMS

Ronald J. Coash, Deshler, Nebr., assignor to Reinke Manufacturing Company, Deshler, Nebr.

Filed Apr. 7, 1977, Ser. No. 785,595
Int. Cl.[2] B05B *17/04*
U.S. Cl. 239—1 **10 Claims**



1. In a mobile irrigation system having an elevated pipe for receiving liquid, an outlet in the pipe for discharging liquid therefrom in a direction generally axially outwardly of the pipe, and valve means which is normally open at times to deliver liquid to said outlet and normally closed at other times to substantially interrupt flow of liquid to said outlet, the combination therewith of:
a wind sensing mechanism operable to detect the presence of wind in excess of a predetermined velocity;
means mounting said sensing mechanism in an orientation to detect the presence of wind generally parallel to the pipe axis both inwardly and outwardly thereof; and
means coupling said sensing mechanism with said valve means in a manner to close the latter in response to detection of wind in a direction generally outwardly of and parallel to said pipe during times when said valve means is normally open, and to open said valve means in response to detection of wind in a direction generally inwardly of and parallel to said pipe during times when said valve means is normally closed.

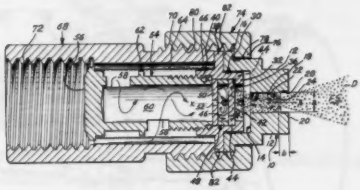
4,128,206

LOW DRIFT FLAT SPRAY NOZZLE AND METHOD

Dennis W. Bintner, Des Moines, Iowa, assignor to Delavan Corporation, West Des Moines, Iowa

Filed May 31, 1977, Ser. No. 801,836
Int. Cl.[2] B05B *1/04*
U.S. Cl. 239—11 **14 Claims**

1. A nozzle for producing a flat spray discharge having substantially large droplets of liquid therein, said nozzle comprising
a substantially gas free turbulence chamber,
first orifice means for introducing a jet of liquid into said turbulence chamber,
a second chamber,
partition means between said turbulence chamber and said second chamber, said partition means having a surface positioned in the path of said jet upon which said jet of liquid impinges to cause substantial turbulence in the liquid in the turbulence chamber,



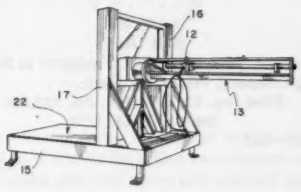
passage means for conducting the turbulent liquid past said partition means from said turbulence chamber to said second chamber, and
discharge orifice means at the end of said second chamber opposite said partition means, said discharge orifice means discharging said turbulent liquid from said second chamber in the form of a flat spray pattern having large droplets of liquid therein.

4,128,207

FLUID DELIVERY SYSTEM

Amos Pacht, 9218 Benning, Houston, Tex. 77071, and Herbert L. Johnson, 8210 Beechnut, Houston, Tex. 77036

Filed Sep. 29, 1976, Ser. No. 727,635
Int. Cl.[2] B05C *7/02*
U.S. Cl. 239—186 **39 Claims**



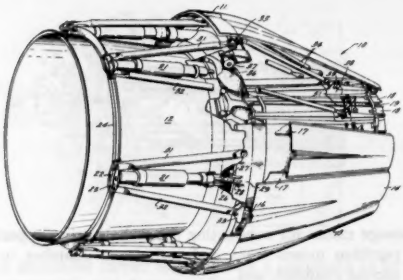
1. A fluid delivery system for removing material from the inside wall of a motor stator including a plurality of longitudinal grooves, comprising, in combination:
a base frame;
a vertical wall mounted on said frame whereby an operator's position is provided on said frame on one side of said wall;
a horizontally extending, longitudinal rotatable carriage frame mounted on said vertical wall and extending from the side of said vertical wall opposite the side on which said operator's position is located;
means located on the operator's side of said wall for selectively rotating said carriage frame;
a nozzle carriage mounted on said carriage frame for movement along a substantial part of the length of said carriage frame;
means for selectively causing said nozzle carriage to move along said carriage frame;
a high pressure outlet nozzle mounted on said nozzle carriage;
a source of high pressure fluid including a high pressure pump; and
dump valve means connected between said pump and said outlet nozzle for selectively providing a high pressure blast of fluid from said outlet nozzle.

4,128,208

EXHAUST NOZZLE FLAP SEAL ARRANGEMENT

Edward W. Ryan, Mason, and George H. Israel, Jr., Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jul. 11, 1977, Ser. No. 814,567
Int. Cl.[2] B64C *15/08*
U.S. Cl. 239—265.39 **9 Claims**



1. An improved linkage means for an aircraft engine variable exhaust nozzle of the type having a plurality of circumferentially spaced flaps with seals interposed therebetween and overlapping adjacent pairs, wherein the improvement comprises:

(a) an elongate center bar pivotably connected proximate its center to the proximate circumferential center of the seal; and

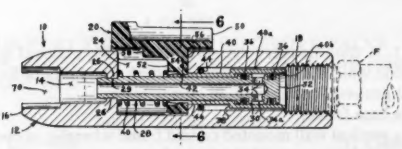
(b) a pair of end bars, each one pivotably connected at its opposite ends to one end of its center bar and to one of the flaps such that an opening of the flap causes a rotation of said center bar and said pair of end bars to maintain the seal in centered relationship between the adjacent flaps.

4,128,209

AIR GUN

John L. Johnson, Morrisville, N.C., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Sep. 12, 1977, Ser. No. 832,596
Int. Cl.[2] F16K *3/24*
U.S. Cl. 239—583 **9 Claims**



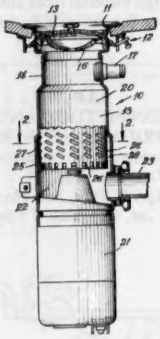
1. An air gun comprising an elongate body being formed with an axial bore and a lateral opening in from the side intercepting the bore, a tubular element having an axial opening and being coaxial with the body and secured in the body at one side of the lateral opening and extending in the lateral opening and therebeyond toward the upstream end of the body to terminate in the body in a spool portion including a closed outward end and radial opening means communicating with the axial opening of the tubular element, the upstream end of the body adapted to be connected to an air hose and the opposite end of the body being formed with nozzle means, tubular valve means on the tubular element and snugly engaging the spool portion and adapted to be slid back and forth to cover or uncover the radial opening means, the valve means being accessible through the lateral opening, sealing means circumposing the valve means and sealingly engaging the body and the valve means, and actuator means secured to the valve means in the lateral opening and extending out the lateral opening and adapted to be hand-shifted to move the valve means to cover or uncover the radial opening means.

4,128,210

FOOD WASTE DISPOSAL APPARATUS

Robert A. Brenner, St. Joseph; Victor W. Cuthbert, Sodus, and Albert T. Braga, Stevensville, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 24, 1977, Ser. No. 781,009
Int. Cl.[2] B02C *18/40*
U.S. Cl. 241—46 R **14 Claims**



1. In a waste disposer having a tubular housing wall partially defining a grinding chamber, a cutter wheel having a cutter-impeller, means for rotating the cutter wheel about a vertical axis at a lower portion of the grinding chamber at a high speed such as in the order of 11,000 rpm, a lower outlet from the housing, and a tubular wall member fixed in said grinding chamber substantially coaxially of said cutter wheel and having lower openings adjacent said cutter wheel for cooperating therewith in cutting waste delivered downwardly with mixing water into said grinding chamber onto said cutter wheel, said wall member having an outer diameter of approximately 3 inches and being smaller than the diameter of the housing wall to define a downwardly opening thin annular space therebetween, said wall member further defining a plurality of upper openings spaced less than approximately 2 inches above the bottom of the wall member, the improvement comprising

the construction of said openings, said wall member, said housing wall portion and the rotated cutter-impeller to cooperatively effectively define means for providing a sufficiently forceful flow of the cut waste and water effluent effectively outwardly through said lower openings and impingement against said outwardly adjacent portion of said housing wall to cause concurrently a first portion of the effluent to be diverted upwardly through said annular space and cause at least a portion of the upwardly diverted effluent to be effectively pumped inwardly through said upper openings for recirculation in said grinding chamber to cause dislodging of lodged waste on the inner surface of said wall member.

4,128,211

COLORANT COMMINUTING APPARATUS FOR PLASTIC ARTICLE FORMING MACHINE

William B. Bradbury, Brielle, N.J.; Robert H. Watts, Cincinnati, and E. Timm Scott, Norwalk, both of Ohio, assignors to PMS Consolidated, Somerset, N.J.

Continuation-in-part of Ser. No. 650,938, Jan. 21, 1976, Pat. No. 4,057,193. This application Apr. 28, 1977, Ser. No. 791,936
The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.
Int. Cl.[2] B02C *19/00*
U.S. Cl. 241—101.6 **5 Claims**

1. An apparatus for comminuting pigment bar and mixing

the comminuted pigment with an uncolored plastic material before said material passes into a plastic article forming machine, said apparatus comprising:

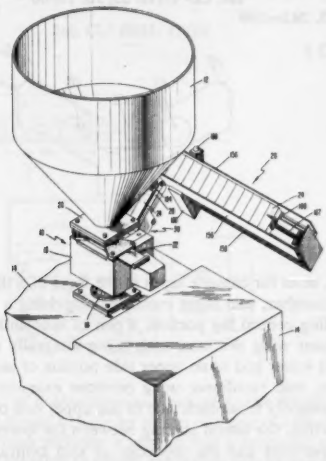
(a) a housing attached to said plastic article forming machine;

(b) cutter means rotatably mounted within said housing;

(c) magazine storage means to store a plurality of colored pigment bars laterally adjacent to each other;

(d) a feeding mechanism removably attached to said housing to feed said pigment bars into contact with said cutter from said magazine;

(e) first motor means attached to said housing and drivingly connected to said cutter so as to rotate same;



(f) second motor means movably attached to said housing and drivingly connected to said feeding mechanism by interengaging gears;

(g) means to move said second motor out of driving engagement with said feeding mechanism by disengaging said interengaging gears;

(h) means to operate said feeding mechanism manually when said gears are disengaged;

(i) a hopper for storing an uncolored plastic material attached to said housing such that said material flows from said hopper into said housing; and

(j) valve means interposed between said hopper and said housing to control the flow of plastic material into said housing.

4,128,212

SEAM RESPONSIVE SHEAR AND METHOD

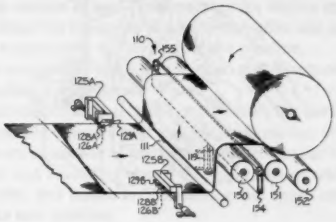
Steven W. Birch, Monroe, N.C., assignor to Birch Brothers Southern, Inc., Waxhaw, N.C.

Filed Jun. 23, 1977, Ser. No. 809,427

Int. Cl.[2] B65H *19/20, 17/08*

U.S. Cl. 242—56 R **28 Claims**

1. In a web material handling apparatus having means for guiding lengths of web material joined by widthwise seams along a path of travel, and shear means for cutting web material at a predetermined position along the path of travel, an improvement which controls shear means actuation so as to minimize web material waste and comprising: a plurality of seam detector means mounted adjacent said path of travel, upstream of said shear means position, each for sensing widthwise seams in web material guided along said path of travel toward said shear means position; and control means operatively connected to said detector means and to said shear means for moving said shear means relative to web material in



response to and in predetermined relation with seam sensing by all of said detector means.

4,128,213

METHOD FOR REGULATING A WINDING PROCESS

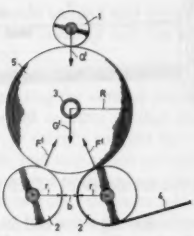
Pekka Komulainen, Kemi, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Dec. 20, 1977, Ser. No. 862,759

Claims priority, application Finland, Dec. 28, 1976, 763709

Int. Cl.[2] B65H *17/08*

U.S. Cl. 242—66 **9 Claims**



1. A method for regulating the internal tension of a web roll being wound in a winder including two support rolls under said web roll and a rider roll above said web roll, the distance between the centers of said support rolls being kept, during the whole winding process, smaller than the sum of the distances from the center of said web roll to the centers of said support rolls, said method comprising the steps of increasing continuously the distance between said support rolls at the beginning of the winding process, and, at a later phase of the winding process, decreasing said distance.

4,128,214

DEVICE FOR WINDING A BOBBIN

Henricus J. Maas, 395, V. Montgomerylaan, Eindhoven, Netherlands

Filed Jul. 11, 1977, Ser. No. 814,422

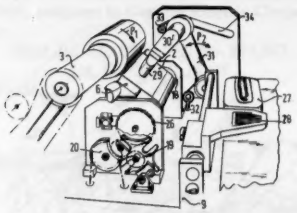
Claims priority, application Netherlands, Jul. 12, 1976, 07710

Int. Cl.[2] B65H *17/02*

U.S. Cl. 242—67.3 R **11 Claims**

1. A device for winding a web of material into a bobbin for storing tobacco leaf or portions thereof between the layers, said device comprising a spindle for holding a stock reel, a second, driven spindle for the bobbin and a suction box, along the suction surface of which the portion of the web of material located between the stock reel and the bobbin is passed, and a mechanism for applying the tobacco portions to the web of

material above the suction surface, characterized in that the suction surface is at an angle to the plane tangential to the



bobbin and going through the line of intersection of the prolongation of said suction surface with the bobbin.

4,128,215

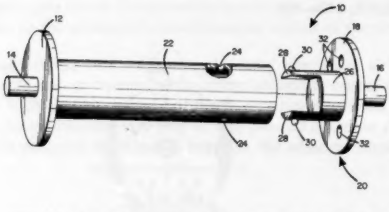
TEXTILE SPOOL

Robert H. Underwood, 19 Stacy St., Saco, Me. 04072, assignor to Robert H. Underwood, Saco, Me. and Richard P. Crowley, Wellesley Hills, Mass.

Continuation-in-part of Ser. No. 697,423, Jun. 18, 1976, Pat. No. 4,078,741. This application Apr. 13, 1977, Ser. No. 786,985

Int. Cl.[2] B65H *75/14, 75/22*

U.S. Cl. 242—118.61 **8 Claims**



1. An improved textile spool which comprises in combination:

(a) a hollow tube having a one end and another end, the tube adapted to carry a filament material thereon;

(b) a first flange at the one end and a second flange at the other end of the tube;

(c) a first axial shaft extending from the one end of the tube and a second axial shaft extending from the other end of the tube;

(d) at least one removable plug element which comprises

(i) a cylindrical body element having an inner and an outer face and the body adapted to fit in a snug slidable relationship within the inner diameter at the one end of the tube, the first shaft extending centrally and outwardly from the outer face of the body element, and

(ii) at least two elongated tongue elements extending generally axially from the inner face of the body element and the tongue elements generally in opposing positions, the tongue elements adapted to yield axially inwardly slightly on the application of a force and tension-biased to return to their original position;

(e) discrete raised projection means positioned on the surface toward the extending yieldable end of each of the tongue elements or on the internal wall of the tube;

(f) one or more discrete projection-receiving passageway means in the tongue elements or in the wall of the tube; and

(g) the projection means and projection-receiving passageway so formed to permit insertion into and removal from the projection-receiving passageway by the respective use of an inward or outward axial force,

whereby, in the assembled condition when the body element has been slid into a snug relationship within one end of the hollow tube, the respective discrete projections are engaged in an interlocking relationship within the respective opposite passageway means so that the axial shaft of the plug element may be driven by spool-driving means, and, on the application of an outward axial force, the tension-biased tongue elements yield inwardly to permit the axial removal of the plug element and to place the textile spool in the disassembled condition.

4,128,216

SHIM FOR CASSETTE TAPES AND METHOD OF SHAPING THE SAME

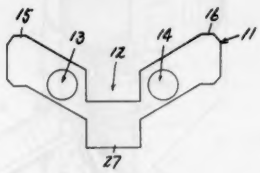
Issaku Hioki, Kuwana, Japan, assignor to NTN Toyo Bearing Company Limited, Osaka, Japan

Filed Jun. 23, 1975, Ser. No. 589,554

Claims priority, application Japan, Feb. 12, 1975, 50-18352

Int. Cl.[2] G11B *23/10, 15/60*

U.S. Cl. 242—199 **4 Claims**



1. A shim for cassette tapes in the form of a thin, one-piece sheet member, said sheet member comprising a downwardly extending central leg portion, a pair of substantially identical rectilinear wing portions, each being integrally secured adjacent its lower end to an upper side portion of said central leg portion, said rectilinear wing portions extending outwardly and upwardly from each side of the upper end of said central leg portion, the lateral spacing between the lower ends of said wing portions and the top edge of said central leg portion defining a rectilinear, central, cut-out portion which functions as a peep portion, said defined cut-out portion being in longitudinal alignment with and upwardly spaced from said central leg portion, and a shaft receiving aperture portion in each wing portion for receiving a shaft therein for winding and rewinding a tape carried by the cassette.

4,128,217

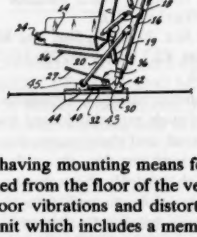
SYSTEM FOR ISOLATING FLOOR VIBRATION AND DISTORTIONS FROM AN OBJECT SUCH AS AN AIRCRAFT SEAT

Bernard Mazelsky, West Covina, Calif., assignor to ARA, Inc., West Covina, Calif.

Filed Jul. 22, 1977, Ser. No. 817,982

Int. Cl.[2] B64D *25/04*

U.S. Cl. 244—122 R **9 Claims**



1. An assembly having mounting means for an object in an air vehicle supported from the floor of the vehicle for isolating the object f:om floor vibrations and distortions, in combination, at least one unit which includes a member made of resilient material with a holder therefor, an insert embedded in the resilient material having an opening extending through said insert to receive support pin means, the resilient material being

sufficiently resilient to allow limited movement of the mounting means relative to the pin means for isolating vibrations from the object, and the material of the insert being crushable so that said insert may be crushed by distortional movements of the mounting means with isolation of said movements from the object.

4,128,218

METHOD OF DIRECTION FINDING AND DIRECTION INDICATION OF RAILBOUND VEHICLES

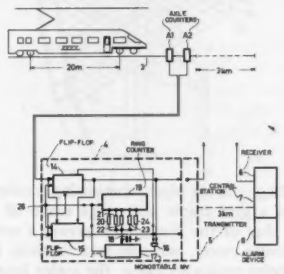
Winfried Pohlig, Stuhr, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,630

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2640971

Int. Cl.[2] B61L *13/04*

U.S. Cl. 246—247 **8 Claims**



1. A method of determining and indicating the direction of travel of a rail-bound vehicle by means of a pair of axle counters each of which includes a seismic and a magnetic sensor which operate together to supply electric signals having a time sequence which indicates the direction of vehicle travel, said method comprising arranging said pair of axle counters along the railway track and spaced from each other in a direction parallel to the track rail, a seismic sensor being made operative to actuate its axle counter only when a railway vehicle is in its vicinity, making a first time sequence reading by means of said pair of axle counters and with the seismic sensors operative, inhibiting the making of a second time sequence reading for a first time period subsequent to the making of the first time sequence reading, making a second similar time-sequence reading for another vehicle axle after the first time period is terminated, inhibiting the making of a third time sequence reading for a second time period different from the first time period and subsequent to the making of the second time sequence reading, and summing the first and second time sequence readings to derive a direction of vehicle travel indication therefrome

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4,128,219

ABOVEGROUND SLIDING SUPPORT ASSEMBLY FOR A PIPELINE

Noyle B. Kaigler, Jr., deceased, late of Baytown, Tex.; by Mary A. Kaigler, executrix, Gloster, Miss.; Spence L. Hochstein, and James A. Maple, both of Anchorage, Ak., assignors to Exxon Production Research Company

Filed May 17, 1976, Ser. No. 686,882

Int. Cl.[2] F16L *3/16*

U.S. Cl. 248—55 **7 Claims**

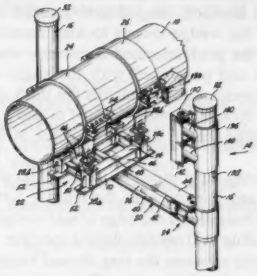
1. A sliding support for an aboveground pipelne, said pipeline traversing a relatively straight path at the location of said sliding support, comprising in combination:

a supporting cross member and means for mounting said cross member above the ground and in stationary relationship thereto, said cross member having a generally horizontal upper surface and being positioned under the path of said pipeline,

a sliding shoe including a base member having a bottom surface, the bottom surface of said base member being oriented in substantially parallel relationship to the upper surface of said cross member and being mounted on the upper surface of said cross member for sliding movement in a direction along the path of the pipeline and in a direction transversely to the path of the pipeline,

at least one upright member affixed to said base member and extending upwardly therefrom,

a bar associated with said upright member for movement in a generally upward and downward direction relative to the bottom surface of said base member, said bar having an upper end extending above the upper end of said upright member, and means for connecting the upper end of said bar to said pipeline,



means associated with said bar and said upright member for preventing lateral movement of said bar relative to said upright member, and

adjustable stop means associated with said bar and said upright member for fixing the vertical position of said bar relative to said upright member so that said bar cannot move downwardly, to thereby support the weight of said pipeline on said shoe, said stop means and said bar being so constructed and associated with said upright member as to be freely movable upwardly relative to said shoe, thereby allowing said shoe to freely fall from said bar if said shoe and said cross member become relatively displaced.

4,128,220

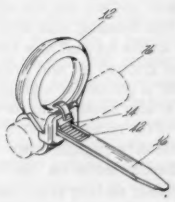
FLEXIBLE STRAP SUPPORT FASTENER

William O. McNeel, Houston, Tex., assignor to Geo Space Corporation, Houston, Tex.

Filed Mar. 31, 1977, Ser. No. 783,059

Int. Cl.[2] F16L *3/12*

U.S. Cl. 248—60 **6 Claims**



1. A flexible adjustable holding means for fastening an article to a support comprising

a ring-shaped hanger adapted to be affixed to a support; said ring-shaped hanger including means located at the periphery thereof defining a cavity between a first and second opposed spaced parallel surface with the walls of said cavity forming a first opening in the first surface and a second opening having a smaller cross sectional area than

said first opening in the second surface; said cavity having a ramp surface formed on the cavity wall adjacent the ring-shaped hanger;

a wedge-shaped locking member having means defining a thin end, a thick end, a sloping surface extending on one side between the thin end and thick end and an opposed planar surface having a predetermined transverse width on the other side of the wedge-shaped locking member, said wedge-shaped locking member being adapted to be positioned in said cavity with the thin end thereof extending through said second opening and the thick end thereof extending through said first opening with the sloping surface of the wedge-shaped locking member being in engagement with the cavity wall ramp surface, said wedge-shaped locking member including a plurality of parallel sawtooth-shaped teeth located on the planar surface of the wedge-shaped locking member and extending across the predetermined transverse width of the planar surface and positioned with the angle of the sawtooth-shaped teeth pointed towards the thick end of the wedge-shaped locking member located in said first opening when the wedge-shaped locking member is inserted into said cavity;

an elongated strip member attached to and extending between and integral with the interior surface of said ring-shaped hanger and the edge of said wedge-shaped member for holding said wedge-shaped member when external to the cavity adjacent the ring-shaped hanger, said elongated strip member being of sufficient length to permit said wedge-shaped member to be inserted into said cavity;

an elongated flexible strip member having one end thereof affixed to the cavity defining means between said first and second opening and the other end thereof being free, said strip member having a width greater than the predetermined transverse width and the surface facing the first opening including means for defining an elongated recessed central area having a width of a sufficient dimension to receive and mate with the planar surface of the wedge-shaped locking member and extending lengthwise in said strip member and a plurality of parallel sawtooth-shaped teeth extending across the width of the surface of the recessed central area of said strip member surface and positioned with the angle of the sawtooth-shaped teeth pointed toward the first opening; and

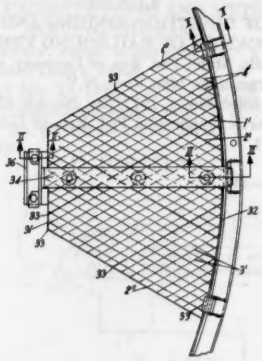
a plurality of spaced elongated gripping protrusions positioned on the outer surface of the cavity defining means on said ring-shaped hanger and extending between the edge of the second opening to the edge of the cavity defining means adjacent the fixed end of the strip member, said free end of the strip member being adapted to be inserted into the second opening, through the cavity between the sawtooth-shaped teeth formed on the wedge-shaped locking member planar surface and the adjacent cavity wall, and out of said first opening, said strip member being adapted to have an article located in a loop formed by said strip member and gripped by said gripping protrusions as the strip member is pulled through said cavity and tightened around an article causing the sawtooth-shaped teeth on the surface of the recessed central area of the strip surface to unidirectionally engage, mate with and slide over the sawtooth-shaped teeth on the wedge-shaped locking member's planar surface positioned in said recessed central area in response to a force pulling the strip member through said first opening and to engage and lock against the sawtooth-shaped teeth on the wedge-shaped locking member's planar surface and to urge the sloped surface against the ramp surface in response to a force pulling in an opposite direction and the flat surfaces thereof lock together pushing the wedge-shaped sloping surface against the ramp surface in response to a force in the opposite direction preventing relative movement between the wedge-shaped locking member and strip member.

4,128,221

CONSTRUCTION OF A SUPPORTING GRID FOR PIPES

Franco Straffi, Milan, Italy, assignor to Breda Termomeccanica S.p.A., Milan, Italy

Filed Mar. 22, 1976, Ser. No. 668,963
Claims priority, application Italy, Oct. 17, 1975, 28382 A/75
Int. Cl.[2] F28F 9/00
U.S. Cl. 248—68 R **9 Claims**



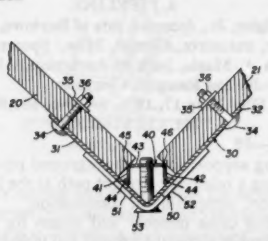
1. A supporting grid for pipes, comprising a reticular structure formed of a grid frame and strips made of a material different from that of the frame and having a manhole and associated reticular cover, wherein said manhole is approximately of isosceles trapezoid shape, the major base of which comprises a segment of the grid frame, the minor base a strip nearly parallel to the former, and the two sides comprise two strips, means securing said cover to the grid, said securing means including connecting means between the grid and cover for preventing tengential movement of the cover relative to the grid frame, preventing perpendicular movement of the cover relative to the plane of the grid, and enabling free expansion of the cover in a radial direction relative to the grid frame, said cover including a stiffening member secured thereto and being rigidly and releasably secured to the reticular structure of the grid, said stiffening member including two plates arranged on opposite surfaces of the reticular cover, said plates being secured to said reticular cover by means of axially bored bushings extending between the plates, a pin in each bushing welded to said plates, securing the latter to each other and to the reticular cover.

4,128,222

LEG ASSEMBLY FOR PINBALL GAME

Max Wiczer, Skokie, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Feb. 9, 1978, Ser. No. 876,359
Int. Cl.[2] A47B 13/00
U.S. Cl. 248—188 **13 Claims**



1. A leg assembly for a pinball game having two side walls intersecting to define a corner, said leg assembly comprising an angle member on the corner and having a pair of substantially perpendicular angle flanges respectively abutting the side

walls, first fastening means attaching said angle member to the walls, a channel member having a bight and a pair of channel flanges respectively attached to said angle flanges, the intersections of said bight and said channel flanges respectively defining stops respectively in contact with the side walls, a leg having substantially perpendicular leg flanges respectively in juxtaposition with said angle flanges, and second fastening means securing said leg to said angle member.

4,128,223

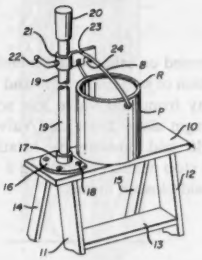
STEP LADDER BRACKET

Merrel F. Brownlee, 58 Euclid Ave., Struthers, Ohio 44471

Filed Mar. 23, 1977, Ser. No. 780,531

Int. Cl.[2] E06C *7/14*

U.S. Cl. 248—211 **1 Claim**



1. A step ladder bracket and vertically extending safety handle for a step ladder and comprising a horizontally flanged fitting for engagement on a horizontal portion of said step ladder, a vertical post detachably engaged in said fitting so as to extend above said step ladder to form said safety handle, a resilient hand grip on the upper portion of said vertical past, a sliding clamp on said post, said clamp having an annular body movably engaging said post and a horizontally disposed extension on said annular body, at least one notch in each of the upper and lower portions of said horizontally disposed extension, said notch in the upper portion of said horizontally disposed extension being positioned at a 45° angle with respect thereto so as to incline downwardly and outwardly with respect to said annular body of said sliding clamp so that a bucket bale engaged in said 45° slot will hold a bucket positioned on said horizontal portion of said step ladder, a rotatable threaded clamping arm engaged in a threaded opening in said annular body so as to engage said post whereby said notch in the lower portion of said horizontally disposed extension may be engaged over the rim of said bucket on said step ladder and said clamping arm secured to said post to hold said bucket on said step ladder.

4,128,224

SUPPORT DEVICE FOR DISPLAYING SPECTACLES

Claude Guichard, Saint-Claude, France, assignor to Etablissements Rene Guichard, Saint-Claude, France

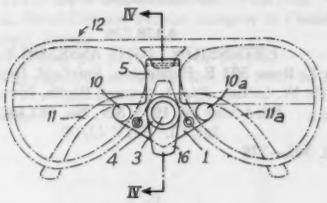
Filed May 13, 1977, Ser. No. 796,660

Claims priority, application France, May 20, 1976, 76 15269

Int. Cl.[2] A47F *5/00*

U.S. Cl. 248—316 A **6 Claims**

1. A support device for displaying spectacles comprising: for attachment to a support wall, a base member, a rod forming part of the base member, a gripping member slidably mounted on the rod and able to retain the folded sides of a pair of spectacles to be displayed against said base member, spring means to urge said gripping member towards said base member to retain the spectacles thereby and two support lugs provided on the base member on either side of the rod on which the gripping



member slides, which lugs support the sides of the pair of spectacles.

4,128,225

CONSTANT TORQUE ADJUSTABLE SEAT

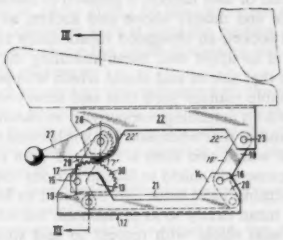
Bernd Klüting, Radevormwald, and Hans W. Voss, Wuppertal, both of Fed. Rep. of Germany, assignors to Firma Fritz Keiper KG, Remscheid, Fed. Rep. of Germany

Filed May 31, 1977, Ser. No. 801,740

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626442

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—421 **8 Claims**



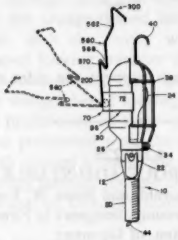
1. An arrangement for lifting a load, particularly an adjustable seat, comprising a base member having a curved bearing surface; a carrier member adapted to support a load; means for mounting said carrier member on said base member for movement between a lowered position and a raised position relative to said base member; actuating means including an actuator turnable about a pivot point which is movable in a curved path in a range between first and second end limiting positions and engaging said bearing surface at different engagement points throughout said range, said curved path being spaced from said bearing surface such that the distance from said pivot point to the respective engagement point has a predetermined length when said pivot point is at said first position and a length exceeding said predetermined length when said pivot point is at said second position said actuating means being operative for moving said carrier member relative to said base member between said lowered position in which the load has a weight component of predetermined magnitude tangentially of said curved path, and said raised position in which the load has a weight component tangentially of said curved path which has a magnitude less than said predetermined magnitude; and means for orbiting said pivot point along said path between said first and second positions as said carrier member is respectively moved from its lowered toward its raised position such that each successive distance between each instantaneous position of the pivot point and the respective engagement point has a length exceeding a preceding such distance in substantially inverse proportion to the change in magnitude of the tangential weight component of the load, so that the force necessary for

turning said actuator to thereby lift the load remains substantially constant during the movement of the carrier member.

4,128,226
EXTENSION LIGHT ASSEMBLY

Mervin L. Ross, 502 E. Burlington, Fairfield, Iowa 52556, and Marvin W. Gittins, Rte. 1, Council Bluffs, Iowa 51501

Filed May 30, 1975, Ser. No. 582,182
Int. Cl.[2] F21V *15/00*
U.S. Cl. 362—378 **7 Claims**



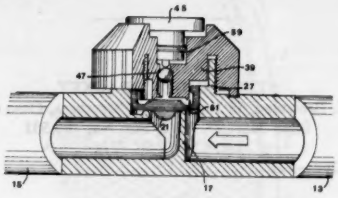
1. An extension light assembly comprising an extension light unit having an upwardly extending socket for receiving a bulb, a handle extending downwardly from said socket, an extension cord electrically connected to said socket and extending out of the lower end of said handle, a protective shield on the rearward side of and mostly above said socket, an electric light bulb in said socket, an elongated substantially rigid stem having a hook at its upper end, mean attaching the lower end of said stem to that side of said shield which is opposite said bulb in an adjustable manner such that said stem can be placed in various positions extending respectively at various angles from said shield and so that when said hook is hooked onto an object the angle at which said stem is disposed with respect to said shield will cause said shield to face in various respective directions for focusing light from said bulb and to be held by said attachment mean firmly so as to maintain the selected angular position of said shield with respect to said stem, said means attaching said stem to said shield comprising a stem positioning assembly comprising a stem pressing means on the rearward side of said shield, means mounting said stem pressing means on said shield comprising spring means attached to said shield and to said pressing means and resiliently urging said pressing means towards said shield, said means attaching the lower end of said stem to said shield further comprising the lower end of said stem having a body portion disposed between said pressing means and said shield and said body portion being pressed against said shield by said stem pressing means, said stem pressing means having an opening therethrough through which said stem extends but through which said body portion of said stem cannot pass, the yielding of said spring means permitting said stem body portion to move with respect to said shield.

4,128,227
SERVO-CONTROLLED VALVE

Inge. S. Blomqvist, Sunne, Sweden, assignor to Sunnex Equipment AB, Sunne, Sweden

Filed Mar. 15, 1977, Ser. No. 777,788
Claims priority, application Sweden, Mar. 19, 1976, 7603418
Int. Cl.[2] F16K *7/12*
U.S. Cl. 251—42 **12 Claims**

1. A valve comprising
a valve housing,
a pressure controlled chamber in said housing having a cylindrical wall, and including a valve seat,
a circular flexible diaphragm in said pressure controlled chamber, and having an integral central portion thereof movable toward and away from said valve seat for controlling fluid flow through the valve,
means for mounting said diaphragm so that a peripheral rim thereof fits to and is loosely applied against said cylindrical wall of said chamber,
removable closure means having a greater diameter than said cylindrical wall and attached by screw threads thereto so that upon removal of said closure means unrestricted access is provided to said chamber so that said diaphragm can be readily inserted therein and removed therefrom, and

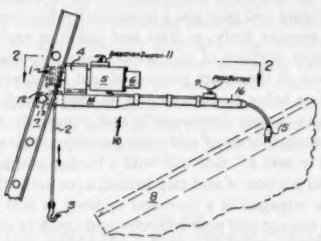


stop means formed on said closure member for abutting said central portion of said diaphragm and thus for stopping its motion away from said valve seat so that movement of said diaphragm away from said valve seat is adjustable from outside said housing by rotation of said closure means, said stop means comprising a central inward projection of said closure means.

4,128,228
EXTENSION LADDER HOIST

Frank E. Ziegelmann, P.O. Box 99 Station A, Auburn, Calif. 95603

Filed Jun. 9, 1977, Ser. No. 805,236
Int. Cl.[2] B66C *23/60*
U.S. Cl. 254—139.1 **5 Claims**



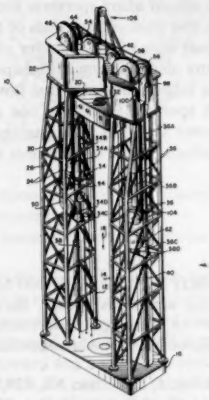
1. A hoist for use with an extension ladder comprising a frame member interposed between said extension ladder and a roof at an upper extremity of said extension ladder so that said upper extremity of said extension ladder is removed from said roof and supported on said roof solely by said frame member through a U-shaped channel on said frame which overlies a rung on the ladder and further includes a locking pin extending through the channel and underlying said rung; a winch disposed on said frame, a cable disposed on said winch having a portion which extends vertically downward between said extension ladder and said roof; and means to wind said cable on said winch disposed on said frame so as to raise and lower a terminal portion of said cable from said upper extremity of said extension ladder to a lower extremity; said means to wind said cable includes a motor connected to said winch through a gear and a shaft, a brake connected to said motor to constrain said motor from motion when the brake is applied, a power source connected to said motor, control means to direct the action of the motor and brake.

4,128,229

HOIST APPARATUS WITH DUAL MAST STRUCTURE AND COMPOUND POWER TRANSMISSION SYSTEM

Thomas L. Elliston, Fort Worth, Tex., assignor to Hydra-Rig, Inc., Fort Worth, Tex.

Filed Nov. 17, 1977, Ser. No. 852,554
Int. Cl.[2] B66C *23/60*
U.S. Cl. 254—139 21 Claims



1. A hoist rig for lifting a load comprising:

a first mast structure for bearing part of the weight of the load,

a second mast structure for bearing part of the weight of the load, the second mast structure being laterally spaced from the first mast structure thereby defining a load lifting zone;

load engaging means disposed intermediate the first and second mast structures for transporting the load through the load lifting zone;

a power transmission system for raising and lowering a load transported by the load engaging means, the system including first and second cable systems secured to the load engaging means, first and second traveling sheaves mounted for movement along the first and second mast structures, respectively, and engaging the first and second cable systems, respectively, whereby the load engaging means moves in response to movement of the traveling sheaves; and,

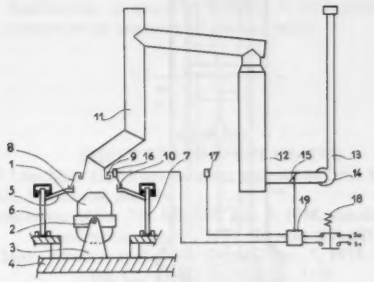
first and second extensible linear actuator means each having rod and housing elements, one of the elements of the first and second actuator means being secured to the upper end of the first and second mast structures, respectively, and the other one of the elements carrying the first and second traveling sheaves of the first and second mast structures, respectively, whereby the load engaging means is displaced through the load lifting zone in response to extension of the rod and housing elements relative to each other and whereby part of the load force imposed on the first and second mast structures is opposed by the reaction load forces produced by the first and second actuator means of the first and second mast structures in response to extension of the rod and housing elements relative to each other.

4,128,230

INSTALLATION FOR THE COLLECTION OF GASES EMITTED BY A TILTABLE CONVERTER

Andre Maubon, Saint-Etienne, France, assignor to Clesid S.A., Saint-Chamond, France

Filed Jun. 16, 1977, Ser. No. 807,342
Claims priority, application France, Jul. 28, 1976, 76 23006
Int. Cl.[2] C21C *5/40*
U.S. Cl. 266—89 4 Claims



1. An installation for the collection of gases and fumes emitted by a converter which is tiltable about a horizontal axis, the installation comprising:

an enclosure for receiving the converter and of sufficient dimensions to allow tilting of the converter and to surround the converter over at least the portion of the converter located above the plane containing the axis of tilt;

a door in said enclosure;

a suction duct secured to the enclosure near the top thereof;

said duct being secured to said enclosure so as to be located above the mouth of the converter when the converter is vertical, the mouth of the converter being uncovered in the enclosure at all times;

a first pressure detector for detecting the pressure of gases in said enclosure near the top thereof;

a second pressure detector for detecting the pressure of gases outside said enclosure;

means for adjusting the draught in said suction duct;

a regulator for controlling said draught adjusting means; and

means connecting said first and second pressure detectors to said regulator;

said regulator being operable to control said draught adjusting means to maintain the difference in the pressures detected by said pressure detectors at a first predetermined value when the converter is vertical and at a second predetermined value substantially greater than the first value when said converter is non-vertical such that the draught in the suction duct is then maximum to provide maximum suction in the enclosure.

4,128,231

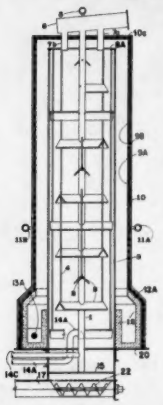
INDIRECTLY FIRED VERTICAL SHAFT FURNACE

Denis H. Jackson, 850 W. Osborn Rd., Phoenix, Ariz. 85013

Filed Mar. 9, 1978, Ser. No. 884,928
Int. Cl.[2] C22B *43/00*; F27B *1/00*
U.S. Cl. 266—154 4 Claims

1. An indirectly fired vertical shaft furnace comprising an elongated upright cylindrical retort, annular combustion chamber means surrounding the lower end of said retort, at least one burner tangentially located in said annular combustion chamber for directing a flame substantially horizontally into said annular combustion chamber in a circumferential direction, cylindrical heat shield means disposed in spaced concentric relation outwardly of said retort and said combustion chamber, said retort and said heat shield each having cover means spaced from each other to define a heating chamber which substantially surrounds the entire length of the retort and the top of the retort to provide a uniform heating of

the retort, means for supplying material through the top walls of said heat shield and retort into said retort, means for withdrawing material from the bottom of said retort and vapor collector means comprising a stationary vertical vapor collector conduit disposed concentrically within said cylindrical retort and having a plurality of spirally arranged apertures therein, downwardly opening concave vapor collector channels rigidly connected to said collector conduit above each of said apertures and extending radially outwardly toward said retort for collecting rising vapors and directing said vapors through said apertures to the interior of said conduit, means for withdrawing said vapors from the upper end of said conduit and rod means secured to the top wall of said retort and the outer ends of said collector channels to support said channels against the weight of the downwardly moving material.

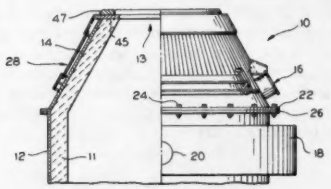


4,128,232

COOLING ASSEMBLY FOR METALLURGICAL VESSELS

Rashed N. Nagati, Mars, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jun. 30, 1977, Ser. No. 811,571
Int. Cl.[2] C21C 5/42
U.S. Cl. 266—241 **11 Claims**



1. A metallurgical vessel having a top opening and cooling means disposed on the surface of said vessel and adjacent said top opening,

a plurality of elongate members affixed to the surface of said vessel in a side-by-side relation and extending generally in the axial direction to define a plurality of adjacent flow passages,

most of said flow passages being in communication adjacent one of their ends with the flow passage on one side thereof and being in communication with the flow passage on the other side thereof at a point adjacent their other end so that cooling liquid in adjacent passages flows in opposite directions,

means defining an elongate flow passageway disposed adjacent one of the ends of said plurality of flow passages and being in communication with one end of first and second spaced apart ones of said plurality of flow passages, said flow passageway defining means at least partially surrounding said vessel top opening, the other end of one of said first and second flow passages being connected to a drain,

one end of a flow passage adjacent one of said first and second flow passages being connected to an inlet,

first and second closure means for closing the opposite ends of said members, said first closure means being disposed between said members and said elongate flow passageway,

first and second spaced apart apertures formed in said first closure means and adjacent the ends of the first and second spaced apart ones of the plurality of flow passages,

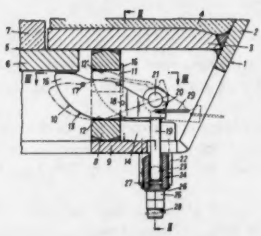
said second closure means having a third aperture therein for connecting the other end of said first flow passage to said inlet, a fourth aperture formed in one of said members disposed adjacent said first flow passage for connecting the passage defined by said one member to a cooling fluid outlet.

4,128,233

CONVERTER-BOTTOM-FASTENING MECHANISM

Manfred Eysn, Linz, and Hans Moser, Seewalchen, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke — Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Sep. 1, 1977, Ser. No. 829,715
Claims priority, application Austria, Oct. 21, 1976, 7829/76
Int. Cl.[2] C21C 5/46
U.S. Cl. 266—243 **14 Claims**



1. In a converter-bottom-fastening mechanism to be used in a converter construction having a removable converter bottom, a converter jacket defining a bottom opening to be covered by the removable converter bottom, and a supporting construction connected to said converter jacket, said mechanism including a plurality of rocker-shaped clamping levers with rocker faces, said clamping levers being peripherally arranged about the removable converter bottom and captured on the converter construction, the improvement comprising:

rocker-like clamping levers that are axially displaceable into and out of an engagement position with said converter bottom in which one of the ends of each of the clamping levers braces the bottom upwardly into the bottom opening;

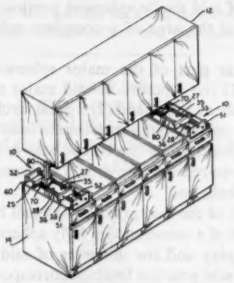
bracing means located between said clamping levers and said converter construction for articulately supporting the other ends of the clamping levers, which other ends face the converter jacket, with respect to the converter construction, and

support members for supporting the center of the clamping levers so that the bracing means can pivot the clamping levers, when in the engagement position, upward against the converter bottom so as to fasten it within the opening in the converter jacket.

4,128,234
CABINET INSTALLATION TOOL

Harry A. McKee, 6851 Roswell Rd., Atlanta, Ga. 30328

Filed Oct. 13, 1977, Ser. No. 841,649
Int. Cl.[2] B25B *11/02*
U.S. Cl. 269—97 5 Claims



1. A tool for mounting cabinets in spaced relationship over base cabinets comprising:

an adjustable frame for mounting across the top of a base cabinet;

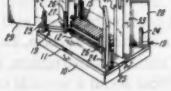
said frame including first rail means for engaging the vertical rear wall of a base cabinet and second rail means for engaging the vertical front wall of a base cabinet, means for adjustably moving said first rail means and said second rail means toward and away from each other so that said adjustable frame fits onto base cabinets of varying thicknesses, and means for fixedly attaching said adjustable frame to the base cabinet,

vertical support means mounted on said frame for supporting an upper cabinet at a preselected height above the base cabinet, said vertical support means comprising socket means mounted on said adjustable frame, a support shaft received in said socket means and normally extending vertically above the base cabinet, and means for retaining said support shaft at various positions along its length with respect to said socket means whereby the tool is mounted on a base cabinet and an upper cabinet is supported above the base cabinet by the upper end portion of said support shaft.

4,128,235
BRAZE FIXTURE

Harry C. Gersbacher, Dayton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Sep. 1, 1977, Ser. No. 829,881
Int. Cl.[2] B23K *37/04*
U.S. Cl. 269—234 12 Claims



1. A fixture useful in positioning and holding parts stacked therein to form an assembled heat exchanger or the like and in holding said parts in an assembled relation during brazing, including:

(a) a base plate providing a multi-sided area within which heat exchanger components corresponding in configuration to said area are stacked one upon another;

(b) part locators of plate-like form mounting on end to stand upright from said base plate;

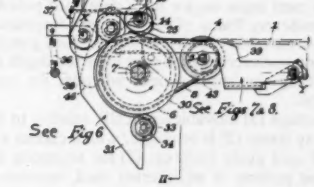
(c) upright side edges of said locators being presented to corners of said area and having portions to engage with respective corners of parts stacked in said area; and

(d) means influencing a movement of said locators toward respective corners of said area, said means yielding to allow an expansion of said parts during brazing while maintaining an engaged relation of said locators with corners of an assembly of stacked parts.

4,128,236
SHEET FEEDING APPARATUS

Leif Lundblad, Huddinge, Sweden, assignor to Inter Innovation AB, Stockholm, Sweden

Continuation of Ser. No. 673,347, Apr. 2, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,601
Claims priority, application Sweden, Apr. 7, 1975, 7503941
Int. Cl.[2] B65H *3/04, 3/06, 3/38*
U.S. Cl. 271—10 9 Claims

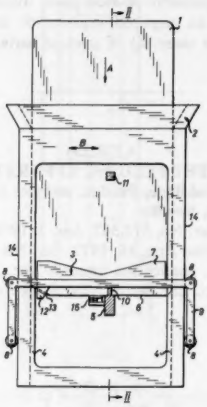


3. Apparatus for removing sheets one at a time from a face of a stack of sheets and feeding the sheets so removed sequentially along a flow-line, said apparatus comprising first feed means for engaging the face and moving a sheet from a stack in a direction substantially parallel to the face and into said flow-line, sheet seizing means downstream of said first feed means along said flow-line for receiving and conveying further along said flow-line a sheet removed from the stack, said sheet seizing means including a nip formed between a second feed means and a roller disposed on opposite sides of said flow-line, lever means operative by a sheet moving downstream of said nip for creating relative separation between said face and said first feed means, said lever means including first and second levers mounted for pivotal movement at respective fixed first and second pivot means, said first lever having a first portion disposed downstream of said nip and normally located to obstruct the flow-line but being movable from said flow-line by the passage of a sheet along said flow-line, said second lever having a first portion remote from said second pivot means for effecting said relative separation between said face and said first feed means, and said first lever having a second portion remote from said first lever first portion for directly contacting and pivoting said second lever in the absence of further movable linkage means about said second fixed pivot means in direct mechanical response to the movement of said first lever first portion by a sheet moving downstream of said nip whereby pivotal movement of said first lever at said first pivot means imparts pivotal movement of said second lever at said second pivot means and movement of said second lever first end portion effects said face and first feed means separation.

4,128,237
CARD INPUT DEVICE FOR PRECISION PUNCHING OF CARDS

Charles G. Bechtiger, Colombier, Switzerland, assignor to Relhor S.A., La Chaux-de-Fonds, Switzerland

Filed Jun. 23, 1977, Ser. No. 809,387
Claims priority, application Switzerland, Jul. 6, 1976, 8665/76
Int. Cl.[2] B65H 9/12
U.S. Cl. 271—241 4 Claims



1. A card input device for a data card punch comprising a card guideway frame of variable card insertion depth, which frame is movable relative to a fixed card punch location in a direction transverse to the card insertion depth dimension, and comprising the improvement wherein, for controlling card insertion:

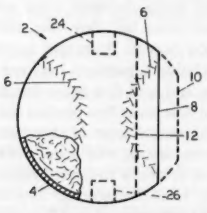
a carriage (3) movable vertically relative to the card guideway frame (2) is provided, which carries at least one pair of card guide members (7) for accepting and guiding an end portion of an inserted card, between which paired members (7) a card accepting and constraining slit (16) provides a vertical through-passage between said members for a card, and

means (5) for limiting vertical card position that are vertically movable for setting the card insertion depth and are not part of nor affixed to said carriage are disposed below said guide members of said carriage in such a manner as to cause the carriage to move together upwardly with said means.

4,128,238
PRACTICE BASEBALL

Nelson F. Newcomb, and Nelson F. Newcomb, Jr., both of P.O. Box Mirror Lake, Mirror Lake, N.H. 03853

Filed Nov. 1, 1976, Ser. No. 737,841
Int. Cl.[2] A63B 37/14, 43/04
U.S. Cl. 273—26 R 3 Claims



1. A practice baseball adapted to be thrown by baseball pitchers and so constructed that when thrown in the manner that a straight ball is thrown by baseball pitchers, it will curve to a controllable degree, said baseball having the following characteristics,

a. it has two distinct outer surfaces one of which comprises the major spherical portion of the surface of a sphere and the other surface has a shape other than that of said major spherical portion,

b. the area of said major spherical portion is between 70% and 93% of the area of a complete sphere of the same diameter,

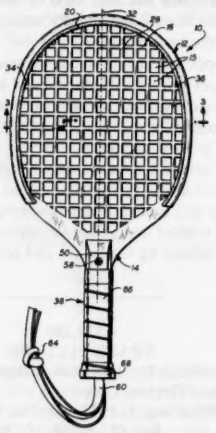
c. the annular part of the major spherical portion lying between (1) the juncture of said major spherical portion and said other surface and (2) a great circle parallel to said juncture is large enough to accept at least one finger of the thrower's hand when the ball is held in the ball gripping position required for throwing a conventional baseball as a straight ball, and

d. the weight of the said practice baseball being the same as the weight of a conventional fully spherical baseball used in league play and the diameter of said major spherical portion of said practice baseball corresponds to the diameter of said conventional fully spherical baseball used in league play.

4,128,239
SOLID MOLDED PADDLE CONSTRUCTION

Lewis Grenadier, 19 Lancaster Ct., Cresskill, N.J. 07626

Filed Oct. 29, 1976, Ser. No. 737,002
Int. Cl.[2] A63B 59/00
U.S. Cl. 273—67 R 6 Claims



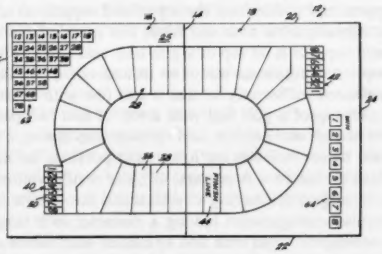
1. A solid molded metal paddle construction comprising a face portion for striking a ball and handle means for gripping said paddle, said face portion comprising a unitary face member having a recessed peripheral edge portion, a plastic sleeve gripping said peripheral edge portion and filling said recess to substantially blend in with the portion of said face immediately adjacent said sleeve so as to present a substantially continuous surface thereat, a plurality of openings extending through said face member, said handle means comprising a handle extension, a solid throat portion between said face portion and said handle extension, said throat portion, face portion and handle extension being of unitary construction, said plurality of openings being symmetrical about a vertical center line, the spacing between said openings being substantially smaller than the diameter of a ball adapted to be hit by said paddle, whereby the ball covers a preselected number of said plurality of openings when it is struck by said paddle, said handle extension comprising an elongated member, a through slot in said extension extending substantially the length of said extension and terminating above the bottom edge thereof, and a grip connected to

said handle extension, said grip comprising a first section on one side of said extension and a second section on the other side of said extension, means for connecting together said extension and said sections, said first and second sections being multi-faceted to provide a multi-faceted grip, said first and second sections having a flat face in contact with said handle extension so as to leave said slot open, and tape means surrounding said first and second sections to increase the friction between said paddle construction and the hand of a player.

4,128,240
TENNIS RACKET
Andrew J. Berokoff, 508 Allis Dr., Montebello, Calif. 90640
Filed Oct. 26, 1976, Ser. No. 735,683
Int. Cl.[2] A63B *49/08*
U.S. Cl. 273—75 **5 Claims**

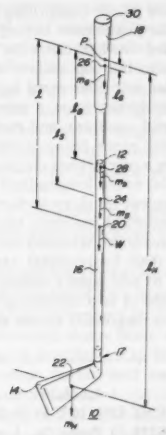
1. A tennis racket including:
(a) a head for striking a ball,
(b) an elongated shaft extending from said head, and
(c) a hand grip extending from said shaft and having front and rear surfaces and at least two side surfaces, said hand grip having at least one hole extending obliquely therethrough from said front surface to said rear surface, said hole being of sufficient size and configuration to permit a person holding said tennis racket to insert a finger therethrough.

4,128,241
RACING BOARD GAME DEVICE
Gonzalo A. Morers, 903 Capri St., Coral Gables, Fla. 33125
Filed Jun. 27, 1977, Ser. No. 810,156
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—246 **4 Claims**



1. A game device comprising a plurality of play pieces and a gameboard, said gameboard having a playing surface with an elliptical track defined thereon by indicia and which elliptical track is divided by lateral indicia into adjacent zones longitudinally arranged along the entire track, said track having corner zones and one of said corner zones of said track being designated a first entrance zone and at a diagonally opposite corner zone with respect to said one of said corner zones there being indicia designating a second entrance zone, each of said entrance zones being separated into a plurality of adjacent entrance zone portions, each of said entrance zone portions being sized to support respectively one of said plurality of play pieces, said game including chance device means, comprising a first conventional die with numerals **1** through **6** and a second die comprising a six-sided cube having an indicia on each main surface designating, respectively, the word "Run", "Tired", "Bumped ", and "Jump", and there being two designated "Run", two designated "Tired", and one designated "Jump" and one designated "Bumped", whereby when the die of the chance devices are thrown simultaneously, the conventional die indicates a number and the other die indicates whether or not the move is to be exactly as shown on the dice, is to be doubled, is to be ignored, or the play piece is to be moved reversely, each of said play pieces comprising member representing a dog, and one of said adjacent zones along said elliptical track spaced from said corner zones being designated "Finish Line".

4,128,242
CORRELATED SET OF GOLF CLUBS
Vance V. Elkins, Jr., Freehold, N.J., assignor to Pratt-Read Corporation, Ivoryton, Conn.
Filed Nov. 11, 1975, Ser. No. 631,165
Int. Cl.[2] A63B *53/00*
U.S. Cl. 273—77 A **27 Claims**



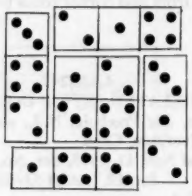
1. A method of producing a correlated set of golf clubs, at least two of said golf clubs having differing lengths and each of said golf clubs having an extended shaft with a clubhead and a grip on opposing ends thereof, including the steps of
(a) establishing predetermined weight distributions over each of the clubs in the set,
(b) establishing predetermined weight moment values for said clubs in said set, and
(c) establishing predetermined physical pendulum (1) moment of inertia and (2) period of oscillation values for said clubs in said set and providing a ratio of the moment of inertia value to the weight moment value for each club which is substantially equal to that ratio for each of the other clubs in said set so that each of the clubs swings about a preselected swing point under the force of gravity with a substantially equal physical pendulum period of oscillation.

16. A correlated set of more than two golf clubs in which each of the golf clubs in the set have differing lengths and each

has a shaft with a grip at one end and a clubhead at the other end comprising

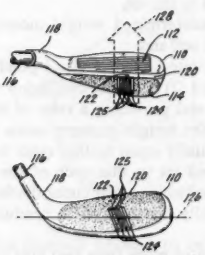
each of the clubs in the set having predetermined physical parmaters of the shaft, grip and clubhead with each of the clubs having substantially the same weight moment about a predetermined pivot and each of the clubs having substantially the same physical pendulum (1) moment of inertia and (2) period of oscillation whereby each of the clubs swings about a preselected swing point under the force of gravity with a substantially equal physical pendulum period of oscillation.

4,128,243
MAGIC SQUARE PUZZLE
Salvatore Pulejo, 445 Marilu St., Richardson, Tex. 75080
Filed May 27, 1977, Ser. No. 801,258
Int. Cl.[2] A63F *9/08*
U.S. Cl. 273—156 **1 Claim**



1. A magic square puzzle comprising a square shaped piece and four rectangular pieces each having a square cross section and a length one and one half times the length of a side of the square shaped piece; the top surface of said square shaped pieces being divided into four equal square shaped quadrants by a pair of perpendicular lines, a numerical indicium being disposed in each said quadrant; and each longitudinal surface of each rectangular piece being divided into three square shaped segments by a pair of lines circumscribing said pieces in planes perpendicular to the longitudinal axis of each rectangular piece, each segment on three surfaces of each rectangular piece having a numerical indicium therein and being of the same size as each quadrant; whereby the rectangular piece can be rotated about their longitudinal axes and placed in surrounding relation to said square shaped piece in an effort to make equal the sums of said numerical indicia taken horizontally, vertically and diagonally across said quadrants and segments.

4,128,244
ALIGNMENT DEVICE FOR GOLF CLUBS
Clovis R. Duclos, 6371 El Paseo Ct., Long Beach, Calif. 90815
Continuation-in-part of Ser. No. 625,940, Oct. 28, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 781,158
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—164 **4 Claims**



1. A golf club head for an iron including a ball striking surface having a center of percussion, an undersurface and means to enable alignment of the user's eyes with the line of desired motion of the golf ball and in a plane containing the line which is oriented at a predetermined angle from horizontal, said means include:

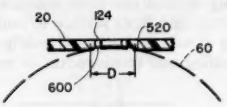
a pair of spaced, facing wall surfaces oriented at right angles to and behind the ball striking surface and at the predetermined angle from horizontal, said wall surfaces being parallel to define a slot and they extend rearwardly behind the ball striking surface in alignment with the center of percussion;

a back surface at an angle opposite from horizontal from said ball striking surface so that said head has a generally triangular cross-section;

a top surface adjacent said back surface, said facing wall surfaces forming a notch which extends partially down said back surface from said top surface; and

at least one indicia line extending along said back surface in a position to be visually aligned with said notch, said indicia line being at an angle from vertical when said club undersurface is resting properly on the ground.

4,128,245
GOLFER'S TRAINING AID
Anthony R. Vlach, 3205 S. 48th St., Omaha, Nebr. 68106
Filed Dec. 16, 1974, Ser. No. 532,942
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—183 A **10 Claims**



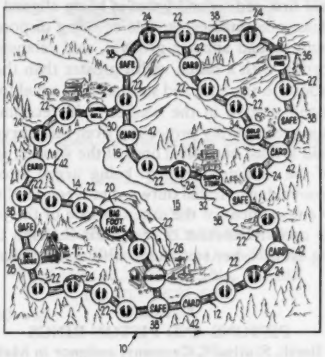
1. A golf-swing guide for use at a golf course tee, in the rough, on fairways, and on putting greens, said guide comprising an indicator support, said support being for resting on top of a ball, said guide being for the purpose of assisting a golfer to position himself for his golf-swing to hit said ball in an intended flight direction extending in an intended flight line to one side of said support, a first direction indicator means on said support and visible from the top of said support so as to be substantially alignable with said flight line as seen from above when said support is on top of a golf ball, said support having a ball-top receiving recess means on its underside, said support being balanced sufficiently so that it can rest with substantial stability on top of a golf ball with a top of said ball partially received in said recess means, said recess means having a recess wall, said recess wall having lowermost portions defining at least three points on a horizontal circular configuration, said circular configuration having a vertical axis through its center, said circular configuration having a diameter in a range between one-eighth of an inch and 1⅛ inches, said recess means having a sufficient depth upwardly of said circular configuration that all points on said recess wall which are disposed inwardly toward said axis are disposed upwardly of a certain spherical configuration, said certain spherical configuration having a diameter of approximately 1.7 inches and a center on said axis and disposed directly below the center of said circular configuration.

4,128,246

CHASE-TYPE BOARD GAME APPARATUS

Alan A. Hicks, Chicago; John O. Spinello, Glendale Heights, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 767,431
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—243 12 Claims



1. In a board-type game apparatus, in combination:

a game board having a relatively large playing surface with a plurality of spaced apart stations thereon positioned at intervals along a travel path, and

a plurality of relatively small playing pieces adapted for movement over said playing surface between said stations along said travel path,

one of said playing pieces having an upper body having an opening in a lower end and a hollow base slidably disposed in said opening, said hollow base accommodating a plurality of disks adapted to be removably contained in vertically stacked relation therein, some of said disks having distinguishing indicia on at least one face thereof and manually loadable in said hollow base in a stack with said faces randomly ordered, said one playing piece including

holding means releasable upon manual placement of said base in pressure contact against said playing surface for releasing a lowest one of said stacked disks from said hollow base to remain on said playing surface when said pressure contact is terminated and said upper body including means engageable with an upper disk in said stack for biasing a lower disk therein against said holding means for release thereof.

6. A playing piece for manipulation on the playing surface of a board game apparatus and adapted to dispense disks thereon comprising:

a hollow body having an opening adjacent a lower end portion thereof and a hollow support base slidably disposed in said opening, said hollow body including means extending downwardly into said hollow base engageable with an upper disk in a stack of disks releasably contained in said hollow base for exerting downward force thereon to release said lower disk for deposit on said board of said apparatus,

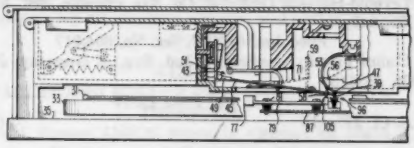
and holding means on said base for retaining a lower disk in said stack and releasable in response to pressure exerted on said lower disk permitting said disk to be released from said support base, said holding means comprising at least one deflectable finger on said hollow support base including pawl means normally engaging said lower disk to retain the same in said stack and deflectable outwardly by pressure exerted by said disk to release the same from the base.

4,128,247

STYLUS POSITION CONTROL SYSTEM

James A. Allen, Monrovia, and Clyde F. Coleman, Crawfordsville, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,591
Int. Cl.[2] G11B 3/10
U.S. Cl. 274—23 R 8 Claims



1. In a playback system for recovering prerecorded information from a spirally grooved record disposed on a turntable rotatably mounted with respect to a base of said system; said system including a stylus housing mounted for lateral travel with respect to said base between an off-turntable rest position and above-turntable playback positions; a groove riding stylus secured to one end of a stylus arm; the end of said stylus arm remote from said one end being secured to a support member mounted within said stylus housing via a compliant coupler; an apparatus comprising:

a stylus arm rest mounted in said stylus housing for motion between an elevated position and a depressed position;

a first permanent magnet mounted on said stylus arm rest;

selectively energized first actuating means including a stationary element means for generating a first field of magnetic flux, mounted within said stylus housing and cooperating with said first permanent magnet when energized, said first permanent magnet being positioned in close proximity to said first field of magnetic flux when said stylus arm rest is in said elevated position, for moving said stylus arm rest from said elevated position to said depressed position;

means for selectively energizing said selectively energized first actuating means when said housing is in said playback positions;

said energizing means serving to provide a given polarity of energization of said magnetic flux generating means; the orientation of said first permanent magnet relative to said magnetic flux generating means being such that said first permanent magnet is repelled away from said magnetic flux generating means during said energization of said given polarity to cause motion of said stylus arm rest from said elevated position to said depressed position;

second actuating means including a second permanent magnet secured on said base beneath the rest position of said stylus housing and cooperating with said first permanent magnet during housing occupancy of said rest position and during travel of said housing between said rest position and an intermediate position between said rest position and said playback positions for causing said stylus arm rest to assume said depressed position during said housing occupancy of said rest position and during said travel of said stylus housing between said intermediate position and said rest position;

said second permanent magnet serving to provide a second field of magnetic flux; the orientation of said first permanent magnet relative to said second permanent magnet being such that said first permanent magnet is attracted towards said second permanent magnet during travel of said stylus housing between said intermediate and said off-record rest position, to cause motion of said stylus arm rest from said elevated position to said depressed position; and

means for moving said stylus arm rest from said depressed position to said elevated position in the absence of said

energization during travel of said housing between said intermediate position and said playback positions.

4,128,248

SHAFT SEAL

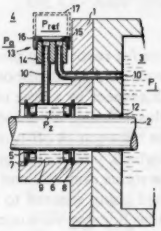
Hans-Peter Kabelitz, Cologne, and Nikolas Sideris, Cologne-Weidenpesch, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 804,017

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625153

Int. Cl.[2] F16J *15/54*

U.S. Cl. 277—15 **4 Claims**



1. A dynamic packing for sealing a shaft which passes through a wall separating an oil-containing region from an oil-free region, comprising: means defining a cylindrical passage through which the shaft extends; two shaft sealing rings disposed in said passage for engagement with the shaft locations spaced along the shaft axis to define therebetween an annular oil-filled gap; means defining a duct composed of one portion communicating with the oil-containing region and another portion communicating with said gap, for placing said gap in communication with the oil-containing space; and closure means composed of a body into which both of said duct portions extend, and a diaphragm disposed with one of its faces in communicatior. with both of said duct portions for selectively blocking passage of oil through said duct in order to selectively control fluid communication between said duct portions.

4,128,249

SEAL FOR A VARIABLE RATIO HYDRAULIC MASTER CYLINDER

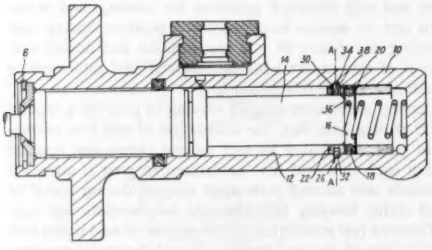
Ferruccio Manzini, deceased, late of Crema, Italy, and Laura C. Manzini, administratrix, Turin, Italy, assignors to Benditalia S.p.A., Crema, Italy

Filed Jan. 19, 1977, Ser. No. 760,602

Claims priority, application Italy, Jan. 21, 1976, 19426 A/76

Int. Cl.[2] B65D *53/02;* F16J *15/46*

U.S. Cl. 277—182 **7 Claims**



1. A fluid tight assembly comprising a casing provided with a bore and a piston which is adapted for movement inside the bore, said bore having a shoulder formed therein, and a fluid tight annular seal and an annular washer supported by the piston, said seal being disposed between the shoulder and washer, said washer having an outside diameter substantially equal to that of the bore and an inside diameter substantially equal to that of the piston, said bore having a first annular groove, said washer also having a second annular groove on its periphery with at least one radial bore at the bottom of said groove, said first and second grooves being aligned with each other, at least one retainer capable of being disposed in both said first and second annular grooves, said retainer having a curved portion with a radial width greater than the depth of the first groove in the bore and substantially equal to the depth of the second groove in the washer, said retaining element having a tongue inwardly projecting from said curved portion through said at least one radial bore of the washer, said curved portion of the retaining element being urged into said first annular groove due to radial outward movement of the tongue caused by engagement of the outer surface of the piston with the tongue upon movement of the piston through the washer for holding said washer stationary within said casing.

4,128,250

PISTONS AND PISTON RINGS

Hermann Barth, Stuttgart, Germany, assignor to Mahle GmbH, Stuttgart, Germany

Continuation of Ser. No. 640,866, Dec. 15, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,498

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1974, 2460883

Int. Cl.[2] F16J *9/00*

U.S. Cl. 277—189.5 **1 Claim**

1. A one-piece annular reinforcement insert for a piston ring groove for a light metal piston, said insert having only a single annular groove formed radially inwards from the outermost periphery of the insert to form opposite flanks, and having cylindrical borings extending within the insert and which are filled with the piston material integral with the piston so as to form pins in the borings, said borings having its ends in the upper and lower annular surfaces of the insert and being disposed on axes inclined in relation to the longitudinal axis of the insert, wherein said borings extend entirely through the two flanks and communicate with the annular groove so as to provide two holes for two pins in each bore one in each of said flanks, said two holes being separated from each other by the annular groove.

4,128,251

SEALING GASKET FOR AIR FILTER

Howard H. Gaither, Albion, and Charles J. Casaleggi, Mt. Carmel, both of Ill., assignors to Champion Laboratories, Inc., West Salem, Ill.

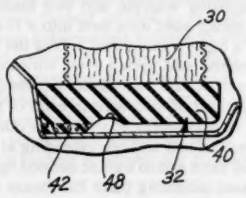
Filed Sep. 21, 1977, Ser. No. 835,153

Int. Cl.[2] F16J *15/06*

U.S. Cl. 277—233 **9 Claims**

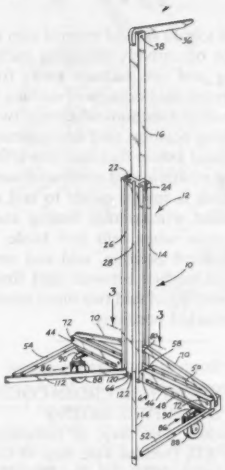
1. A sealing gasket for an air filter comprising an annular member having a base portion and a sealing portion, the base portion having a higher durometer than the sealing portion, whereby the sealing portion can more readily adapt to the contour of a contact surface which it may engage so as to provide a better seal between the sealing gasket and such contact surface, said base portion including a generally flat first

surface and an opposite surface from which the sealing portion projects, and an annular recess in the said opposite surface in



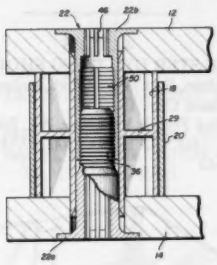
order to provide space for the sealing portion which may be deformed in use.

4,128,252
FOLDABLE SUITCASE DOLLY
John J. Raniero, Box 204, Gearhart, Oreg. 97138
Filed Dec. 20, 1976, Ser. No. 752,204
Int. Cl.[2] B62B *3/02*
U.S. Cl. 280—40 **5 Claims**



1. A foldable hand truck comprising
an elongate telescopic central member,
load support means connected to said central member,
a pair of legs swingably connected adjacent an inner set of their ends to the lower end of said central member for swinging relative to said central member between collapsed positions extending upwardly along and adjacent said central member and extended positions extending outwardly from opposite sides of said central member, substantially normal thereto,
a wheel assembly connected to each of said legs, adjacent the outer end thereof, for supporting said truck above a ground surface when said legs are extended,
a pair of elongate locking arms, each of said locking arms being pivotally connected adjacent one of its ends to one of said legs in a region spaced a distance from the inner end of said leg, said locking arms being independently movable with respect to each other,
a pair of tracks defined in said central member and extending longitudinally thereof, and
means slidably mounting the end of each of said locking arms, opposite its said one end, within an associated track above the pivot connection between said legs and central member, said locking arm being mounted for movement therealong between a locked position adjacent said inner end of said leg, wherein said locking arm extends at a low angle relative to its associated leg, such that the tendency of said leg to swing from its extended to its collapsed position causes the locking arm to press against said central member to frictionally lock said leg in its extended position, and a position slid upwardly along said central member to permit swinging of said leg to its collapsed position wherein said locking arm and the associated elongate leg are disposed adjacent said central member.

4,128,253
PALLET AND ROLLER POST CONSTRUCTION THEREFOR
Richard J. Powers, 4340 N. Marmora, Chicago, Ill. 60610
Filed Oct. 14, 1977, Ser. No. 842,055
Int. Cl.[2] B62B *1/00;* **B65D** *19/26, 19/42*
U.S. Cl. 280—79.1 A **27 Claims**

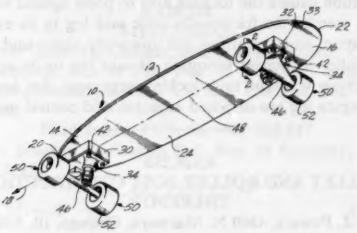


1. A pallet comprising at least an upper platform and a plurality of posts for supporting said upper platform in spaced relationship to a support surface, said upper platform having formed therein a number of holes corresponding in number to the posts secured thereto, said posts each comprising an outer body and a smaller inner body encompassed by said outer body and attached to said outer body by a plurality of spaced apart flanges, said inner body having a portion extending beyond said outer body at at least one end thereof and having an axially aligned bore extending through it, the extended portion of said inner body being disposed within the respective ones of said holes in said upper platform, and a plurality of rivets each having an enlarged diameter base portion and an axially aligned cylindrical shaft portion formed integrally therewith, said cylindrical shaft portion of each said rivet being extended through a respective one of said holes in said upper platform and into said bore in said inner body of a corresponding post to fixedly and replaceably secure each said post to said upper platform.

4,128,254
SKATEBOARD WHEELS
George A. Powell, 725 Union Ave., Santa Barbara, Calif. 93103
Filed Dec. 28, 1976, Ser. No. 754,945
Int. Cl.[2] A63C *17/22*
U.S. Cl. 280—87.04 A **16 Claims**

1. A skateboard comprising an elongated platform having a longitudinal centerline and at lease one pair of wheels secured to and positioned beneath the platform, the wheels being axially spaced apart from each other on opposite sides of the center line along a common axis transverse to the longitudinal centerline of the platform, each wheel defining a circular cylindrical tread surface having an axially inner edge and an axially outer edge, the axially inner edge being closer to the centerline than the axially outer edge, wherein both the axially inner edge and the axially outer edge of the cylindrical tread surface of each such wheel defines a convex surface having a

radius of curvature of from about ¼ to about ½ inch, wherein, the radius of the axially outer edge of the tread surface of such



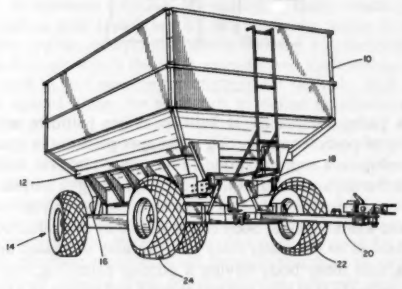
wheels is greater than the radius of the axially inner edge of the tread surface of such wheels.

4,128,255

ROCKING BOLSTER UTILIZING SHOCK ABSORBERS

Kenneth M. Coldren, Fort Wayne, Ind., assignor to M & W Gear Company, Gibson City, Ill.

Filed Feb. 7, 1977, Ser. No. 766,001
Int. Cl.[2] B62D *9/00, 37/00*
U.S. Cl. 280—143 **5 Claims**



1. In a rocking bolster vehicle of the type including a bolster member having a curved rocking surface, a bolster support member having a planar top surface for support of said curved rocking surface, said curved rocking surface being adapted to rock on said top surface, and means for confining the bolster member against translational movement on the support member, said means for confining including the improvement of a pair of shock absorbing means having opposite ends attached respectively to the bolster member and the support member, the ends attached to the bolster member being attached on opposite sides of a center line axis through the bolster member and support member defined by the point of tangency of the bolster member and support member when said members are maintained in a horizontal level condition, the ends of said shock absorbing means attached to the support member likewise being positioned on opposite sides of the center line axis.

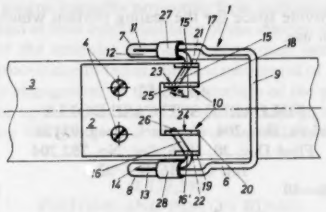
4,128,256

SKI BRAKE

Erwin Weigl, Brunn am Gebirge, Austria, assignor to TMC Corporation, Zug, Switzerland

Filed Apr. 11, 1977, Ser. No. 786,377
Claims priority, application Austria, Apr. 23, 1976, 3004/76
Int. Cl.[2] A63C *7/10*
U.S. Cl. 280—605 **7 Claims**

1. In a ski brake having two blade members each pivotally mounted on a mounting plate attached to the upper surface of a ski for movement between a braking position wherein said blade members extend transversely of and below the bottom surface of said ski and a retracted position wherein said blade members extend above said upper surface of said ski, the improvement comprising wherein said two blade members are formed from a spring steel wire bent into a U-shape having a pair of legs and a bight portion, said legs of the U forming said two blade members, said spring steel wire being bent back upon itself in each of said two blade members 180° with the terminal end portions of said wire in each of said two blade members being bent inwardly toward each other to form axially aligned axles and end sections extending at an acute angle to the axis of said axles and to a plane defined by said U-shaped wire, wherein said mounting plate has means thereon operatively supporting said axles to render said two blade members



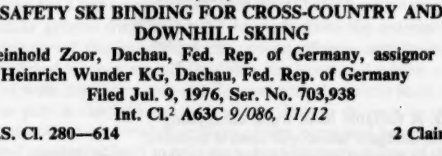
pivotal with respect to said ski and control cam means having a contoured surface operatively engaging each of said end sections and flexing said end sections away from a normal relaxed position thereof, said contoured surface having a first segment engaging said end sections when said two blade members are in said braking position, said first segment being sufficiently spaced from said axis so that said wire is flexed the least when in said braking position, said contoured surface having a second segment which is spaced closer to said axis than said first segment to effect a maximum flexing and consequent torsioning of said wire when said two blade members are pivoted to said retracted position, said end sections sliding along said contoured surface between said first and second segments during a pivoting of said two blade members between said braking and retracted positions.

4,128,257

SAFETY SKI BINDING FOR CROSS-COUNTRY AND DOWNHILL SKIING

Reinhold Zoor, Dachau, Fed. Rep. of Germany, assignor to Heinrich Wunder KG, Dachau, Fed. Rep. of Germany

Filed Jul. 9, 1976, Ser. No. 703,938
Int. Cl.[2] A63C *9/086, 11/12*
U.S. Cl. 280—614 **2 Claims**



1. A safety ski binding for securing a skiboot to a ski, said binding comprising:
- means on said ski defining a primary pivot axis extending generally perpendicular to the normal direction of displacement of said ski;
- a support secured to said means and pivotal about said primary axis;
- a release plate mounted on said support and displaceable relative thereto;
- a toe holder carried on said plate generally at said primary pivot axis and adapted to engage over and around the toe of said boot;
- a heel holder aligned on said ski behind said toe holder

relative to said direction and adapted to engage over and around the heel of said boot;

release means connected between one of said holders and said support for displacement of said plate on said support in any position thereof relative to said ski and freeing of said boot from between said holders on stressing of at least one of said holders in a predetermined direction with greater than a predetermined force; and

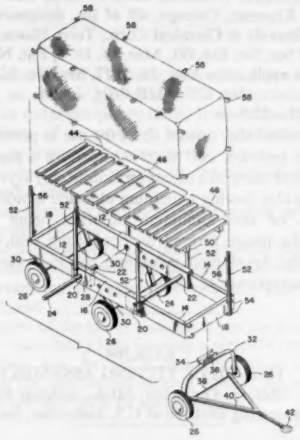
means for releasably securing said support to said ski generally at said heel holder, whereby when thus secured said binding is suitable for downhill skiing and when not secured said binding is suitable for cross-country skiing.

4,128,258

EXTENSIBLE UTILITY WAGON

Robert Johnson, 19419 Wickfield Ave., Cleveland, Ohio 44122

Filed Aug. 5, 1977, Ser. No. 822,067
Int. Cl.[2] B62D *21/14*
U.S. Cl. 280—656 **3 Claims**



1. A utility wagon comprising, in combination, a front section supported on front wheels, towing means vertically movable and secured to said front wheels, an open rear section supported on rear wheels, an open central section supported on wheels and slidably receiving said front and rear sections so that said sections may be telescoped and extended relative to said central section, removable means for locking said front and rear sections on said central section at a selected extension; front, central and rear floor board units adapted to frictionally engage the boundary of the open area of said open sections and a plurality of upright posts removably mounted at spaced intervals on said sections to support a load said removable locking means consisting of a plurality of individual bars, each of which extends substantially for the full width of the wagon in the assembled position, through holes in the joined sections, oriented parallel to the transverse axis of the wagon.

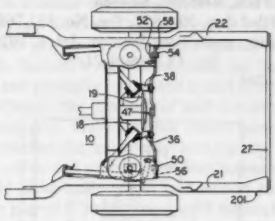
4,128,259

SWAY LIMITING LINKAGE FOR A VEHICLE

Donald Trent, 1050 Clepper La., Batavia, Ohio 45103

Filed May 31, 1977, Ser. No. 801,559
Int. Cl.[2] B60G *19/02*
U.S. Cl. 280—689 **2 Claims**

1. A sway limiting linkage for a vehicle which comprises a pair of lever members, pivot means for the lever members pivotally mounted on running gear of the vehicle on opposite sides of a center line thereof, means connecting inner arms of the lever members to swing up and down together, the means connecting inner arms of the lever members including a pin mounted on one of said inner arms and a lengthwise slot in the other of said inner arms receiving said pin, and means linking outer arms of the lever members to body frame members of the



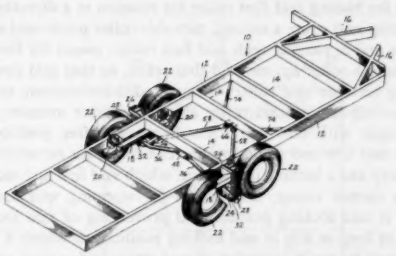
vehicle to cause the body frame members to move toward and away from the running gear in unison.

4,128,260

TANDEM WHEEL SUSPENSION FOR A VEHICLE FRAME

Arthur R. Moore, 58354 Hilly La., Elkhart, Ind. 46514

Filed Sep. 12, 1977, Ser. No. 832,173
Int. Cl.[2] B60G *9/00*
U.S. Cl. 280—676 **20 Claims**



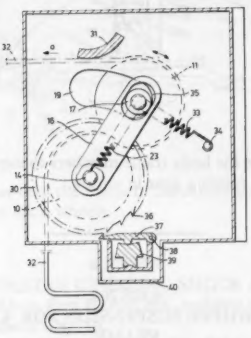
1. A tandem wheel suspension used with a vehicle frame having spaced longitudinal members interconnected by spaced transverse members, said suspension comprising a walking beam located below and extending lengthwise of each longitudinal member, a wheel assembly journaled at each end of each walking beam, each wheel assembly including a wheel positioned outwardly from the vertical plane of the adjacent overhead longitudinal member and a spindle mounted at one end to the wheel and at the other end to a said walking beam, a lower support connected to each walking beam between the spindles of the wheel assemblies jounaled thereto, an upper support connected to each longitudinal member vertically oriented above a said lower support, each vertically oriented upper and lower supports positioned outwardly of the vertical plane of the respective connected longitudinal member and walking beam, resilient means for absorbing road induced shocks carried in contact between each vertically oriented upper and lower supports, pivot means anchored to said frame and journaled to each walking beam in lateral alignment with the lower support connected thereto to provide an axis of rotation for said beam, each walking beam being shiftable vertically between upper and lower operative positions relative to its overhead longitudinal member upon resilient means compression and expansion, said wheel assemblies and connected walking beams and supported resilient means excluding said pivot means constituting the supporting means for all vertical loads upon said frame.

4,128,261

LOCKING DEVICE FOR VEHICLE SAFETY SEAT BELTS

Hannu O. Paitula, Järna, Sweden, assignor to Gränges Essem Aktiebolag Fack, Vesteras, Sweden

Filed Jun. 30, 1977, Ser. No. 811,769
Claims priority, application Sweden, Jul. 1, 1976, 7607522
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—744 **11 Claims**



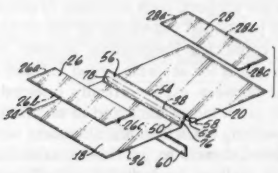
1. A locking device for safety seat belts in vehicles of the type, in which a strap of a seat belt is automatically retracted, at least partly, into a housing, when the seat belt is not used, the locking device comprising a fixed first roller; a first spring means for biasing said first roller for rotation in a direction of retracting said strap; a second, movable roller positioned adjacent to and in parallel with said first roller; means for forcing said second roller against said first roller, so that said strap is passing between said rollers is squeezed therebetween; means for moving said second roller along a circular arcuate path concentric with said first roller between a free position in which said first and second rollers can rotate for extraction of said strap and a locking position, in which said first and second rollers cannot rotate; stop means for stopping said second roller in said locking position and preventing of said second roller as long as it is in said locking position, to which it may be moved by rapid extension of said strap; and second spring means for biasing said second roller towards said free position, so that said movable roller is returned to said free position, when tension in said strap ceases.

4,128,262

MAGAZINE COVER

Gerard M. Du Corday, 10871 Thorley Rd., Santa Ana, Calif. 92705

Filed Sep. 6, 1977, Ser. No. 830,839
Int. Cl.[2] B42D *3/04*
U.S. Cl. 281—34 **12 Claims**



1. A readily attachable and detachable protector for magazines, flexible cover books and the like comprising,

(a) an integral sheet of flexible material having first and second integral end portions adapted to extend along the outside surfaces of the cover of a magazine, book or the like, and having a central portion connected to said integral sheet,

said central portion comprising a spine fixed to and projecting from the surface of said sheet, said spine including first and second spine sections having inner surfaces in face-to-face juxtaposition and securely connected to each other, and

an elongated slot formed in said spine sections extending for substantially the full length of said spine, whereby a magazine or book may be opened and one cover and several pages thereof may be inserted through said slot to position said spine between pages of said magazine or book with said sheet end portions extending about the magazine or book.

4,128,263

MODIFIED CLAY PAPER COATING

James T. Traxler, Evanston; Emil P. Lira, Des Plaines, and John F. Kraemer, Chicago, all of Ill., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 558,491, Mar. 14, 1975, Pat. No. 4,038,097.
This application May 26, 1977, Ser. No. 800,991
Int. Cl.[2] B32B *9/04, 13/04*
U.S. Cl. 282—27.5 **3 Claims**

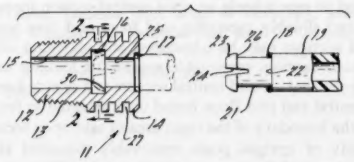
1. A modified clay coated sheet for use in pressure-sensitive duplication systems, said sheet comprising a paper substrate having coated thereon a montmorillonite clay layer, said montmorillonite clay having aluminum chloride bonded thereto, at least 30% of said aluminum chloride being hydrolyzed, whereby the image formed by contacting said coated sheet with a color-developing substance has increased fade resistance upon exposure to light.

4,128,264

TWO-PIECE FITTING ASSEMBLY

William G. Oldford, Lexington, Mich., assignor to Huron Tool & Manufacturing Division of U.S. Industries, Inc., Lexington, Mich.

Filed Jan. 21, 1977, Ser. No. 761,235
Int. Cl.[2] F16L *27/08, 53/00*
U.S. Cl. 285—41 **1 Claim**

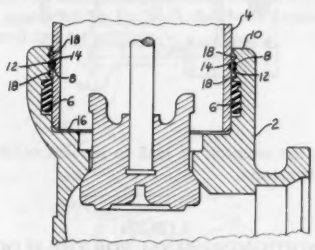


1. A two-piece fitting assembly embodying a first fitting made of metal in the nature of a union having an outer thread on one end, a driving means on the other end, a through aperture on the axis which is enlarged near the center forming a channel shaped annular recess and a counterbore in the other end forming a first shoulder on the interior of said through aperture, and a plurality of radial slots in the outer diameter of the first fitting for cooling thereof, the second fitting is a tube made of plastic material having a reduced end disposed within said aperture of the first fitting, said reduced end forming a second shoulder on the outer diameter of said second fitting and having a head extending into said annular recess to permanently secure the second fitting thereto for relative rotation therebetween, said head being divided into sections to permit the contraction of the sections when the head is inserted into one end of the through aperture and the expansion thereof into said annular recess, and an O-ring sealably disposed and compressed between said first shoulder and said second shoulder.

4,128,265
HYDRANT VALVE CONNECTION

Abraham S. Fenster, and Fred W. Salloga, both of Chattanooga, Tenn., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Jul. 11, 1977, Ser. No. 814,769
Int. Cl.[2] F16L *37/14*
U.S. Cl. 285—305 3 Claims



1. The connection of a hydrant valve body to a lower stand pipe having an annular gasket in radial compression between one end of the outer periphery of the lower stand pipe and the inner periphery of an opening in the hydrant valve body wherein the improvement comprises:

(a) a plurality of lugs around the opening in the hydrant valve body, and

(b) each lug having a peripherially extending groove on its inner periphery, and

(c) one end of the lower stand pipe inserted in the opening in the hydrant valve body and having a continuous groove of a certain radius around the outside periphery of said one end; and

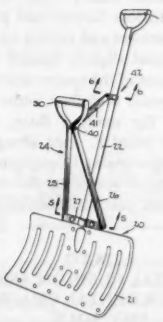
(d) the groove of the lower stand pipe and the grooves of the hydrant valve body lugs forming a series of openings; and

(e) a resilient key, having a radius less than said certain radius of the continuous groove around the lower stand pipe, driven into each of said openings.

4,128,266
AUXILIARY HANDLE FOR LONG-HANDLED IMPLEMENTS

John W. Vaslas, 282 Park St., Staten Island, N.Y. 10306

Filed Oct. 14, 1977, Ser. No. 842,319
Int. Cl.[2] A01B *1/22*; B65G *1/06*
U.S. Cl. 294—58 6 Claims

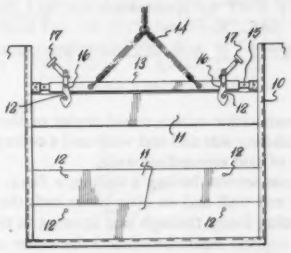


1. An auxiliary handle for use with a long-handled implement having a rod-shaped main handle; said auxiliary handle comprising a triangular frame including a pair of auxiliary handle rods constituting the leg members of the triangle and a transverse member constituting the base member of the triangle, said auxiliary handle rods having respective first and second ends and being closely juxtaposed to one another at said first ends thereof to define the apex of the triangle and being relatively widely spaced from one another at said second ends, said transverse member extending between and being pivotally connected to said auxiliary handle rods at said second ends thereof, a hand grip secured to said auxiliary handle rods at said first ends thereof, a rigid cross-brace bar having first and second ends and pivotally connected at said first end thereof to said frame adjacent the juncture of said auxiliary handle rods with said hand grip, first clamping means coupled with said transverse member for releasably locking the latter to the implement handle, and second clamping means pivotally connected to said cross-brace bar at said second end thereof and adapted to be placed in engagement with the implement handle and releasably locked thereto, whereby said first and second clamping means can be connected with the implement handle in respective selected adjusted positions along the latter for adjusting the angular orientations of said cross-brace bar and said frame relative to one another and the implement handle.

4,128,267
LIFTING BEAM

David C. Niblett, Redditch, and James T. Capewell, Newcastle, both of England, assignors to Simon-Hartley Limited, Staffordshire, England

Filed Aug. 29, 1977, Ser. No. 828,601
Claims priority, application United Kingdom, Sep. 10, 1976, 37540/76
Int. Cl.[2] B66C *1/22*
U.S. Cl. 294—81 R 10 Claims



1. A lifting beam comprising an elongate member, means for attaching a sling thereto for suspending same from a lifting device, and at least one hook pivotally attached to said member for releasably engaging a load to be elevated, characterized by a movable balance weight and means whereby said balance weight may be selectively connected to said hook in either of two opposed positions whereby the hook may be so biased as to be adapted to pivot either into or from engagement with said load automatically upon lowering of the beam towards the load.

4,128,268
FLOWER CAR CONVERTING UNIT

Kenneth C. Sundlof, 2320 Wyckwood, Aurora, Ill. 60506

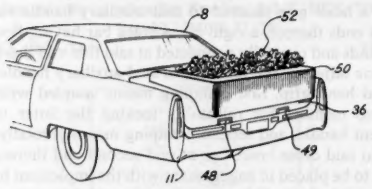
Filed Dec. 1, 1976, Ser. No. 746,401
Int. Cl.[2] B60P *3/02*
U.S. Cl. 296—10 6 Claims

1. Apparatus for converting a passenger automobile including a trunk having a lid suspended on hinges into a vehicle suitable for carrying flowers in a funeral procession comprising:

reservoir means positioned inside the trunk for holding flowers and for catching water draining from the flowers, said reservoir means comprising drain means for draining water to the rear of the automobile;

flower display means defining drain openings through which

the drain means extend for partially covering the trunk and for defining a flower opening located over the reservoir means through which the flowers may protrude; and



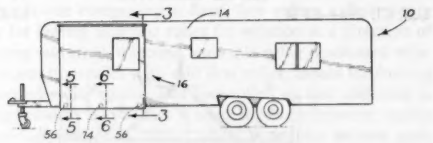
fastener means for attaching the display means to the hinges in place of the lid, whereby the vehicle can be used as a conventional automobile by replacing the display means with the lid.

4,128,269

TELESCOPING ROOM FOR TRAVEL TRAILERS

Bonner B. Stewart, Salem, Oreg., assignor to Hazel F. Stewart, Salem, Oreg.

Filed Jan. 21, 1977, Ser. No. 761,295
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—23 C **7 Claims**



1. In combination with a travel trailer or the like having a floor, upstanding side and end walls and a ceiling and an opening in one of said upstanding walls,

(a) a room section having a ceiling, a floor, side walls, an outer end wall and an open inner end, the room section extending freely through said opening in the trailer wall,

(b) first support means secured to the trailer under the floor thereof and including a tubular member rigidly attached to the travel trailer under the floor thereof and an elongated beam extending slidably through the tubular member and rigidly attached at its outer end to the end wall of the room section below the floor thereof for supporting the room section for reciprocation therewith between a position extending outwardly from the trailer wall and a position retracted into the trailer, and rollers rotatably mounted on the tubular member and engaging the upper and lower surfaces of said beam, and

(c) second support means between the trailer floor and overlying room extension floor for supporting the latter above the trailer floor during reciprocation of the room section.

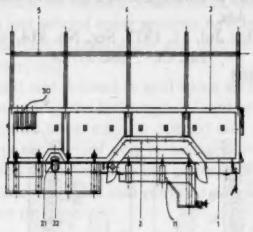
4,128,270

VEHICLE FLOORING CONSTRUCTION

Paul E. R. Legueu, 85, avenue de Mazy, 44380, Pornichet, France

Continuation of Ser. No. 529,509, Dec. 4, 1974, abandoned. This application Nov. 2, 1976, Ser. No. 737,503
Int. Cl.[2] B60P *3/22*
U.S. Cl. 296—28 R **9 Claims**

1. A floor construction for automotive vehicles having wide operating range, comprising two longitudinal rails affixed below the vehicle floor inboard of the lateral edges of the vehicle floor, a water reservoir mounted between the rails and extending nearly the whole length of the floor, and two fuel tanks, respectively suspended below the floor laterally outwardly of the different rails, the reservoir and each tank being mounted by straps and resilient pads inserted between the



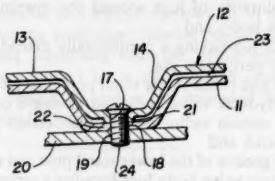
straps and the reservoir or tank to prevent noise when the vehicle is in motion.

4,128,271

RECONDITIONING PANEL FOR THE FLOORS OF PICK-UP TRUCK CARGO BOXES AND CARGO VANS

Rodger Gray, P.O. Box 1137, Hobbs, N. Mex. 88240

Filed Jul. 27, 1977, Ser. No. 819,459
Int. Cl.[2] B62D *32/00*
U.S. Cl. 296—39 R **2 Claims**



1. In a cargo carrying vehicle having a ribbed metallic cargo floor which is subject to denting and marring over a period of time, a reconditioning means for said cargo floor in the form of a metal panel which is sized and shaped to cover the existing cargo floor substantially completely, said panel being ribbed to mate with the ribbing of the existing floor when the panel is placed thereon, said panel being punched to form therethrough a plurality of spaced fastener receiving apertures adapted to register with like apertures of the existing floor, fastener elements engaging through the registering apertures in the panel and existing floor for anchoring both to an underlying vehicle frame part, plural spaced axially short depending annular spacer sleeves on the bottom face of said panel produced by the punching of the apertures and resting on the existing floor and maintaining the panel slightly spaced from the existing floor at least in the regions of the spacer sleeves while allowing the other areas of the panel to deflect under loading into supportive contact with the existing floor, and downturned flanges formed on the panel at least along the longitudinal edges thereof, said flanges sealingly engaging calked seams in the existing cargo floor structure of the vehicle to thereby render the reconditioning panel substantially weather-proof.

4,128,272

MULTI-SEGMENTAL CUSHION ASSEMBLY FOR ADAPTING CONTOUR DENTAL CHAIRS TO A CHILD'S PHYSIQUE

Danny P. Boyle, 855 E. Brown Rd., Mesa, Ariz. 85203

Filed Dec. 1, 1977, Ser. No. 856,399
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—231 **12 Claims**

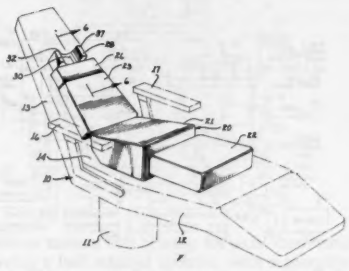
1. A removable multi-segment cushion assembly for adapting a contour dental chair to a child's physique which contour dental chair has a seat and leg support section and a back and

head support section, said cushion assembly comprising in combination:

(a) a seat cushion supported by the seat and leg support section for elevating a child seated upon the contour dental chair;

(b) a back cushion for supporting the child's back, said back cushion being supported by the back and head support section and resting upon the rear edge of said seat cushion; and

(c) a head rest for cradling the child's head, said head rest being supported by the back and head support section, said head rest including:



(1) a depression for receiving the back of the child's head, said depression being of a depth sufficient to encourage backward tilting of the child's head with respect to the child's shoulders; and

(2) side members for precluding side-to-side rotation of the child's head about a pivot point at the rear of the child's head;

whereby, said cushion assembly elevates the child to a height comfortable for a dentist to perform his work and positions the child's head to encourage opening of the mouth at an orientation visually and physically accessible to the dentist.

4,128,273

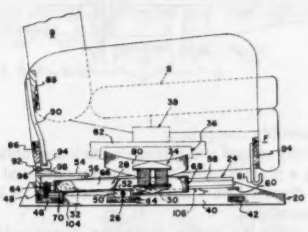
ROCKABLE AGAINST-THE-WALL TYPE RECLINING CHAIR

W. Dale Jones, 7020 Aztec Dr. NE., Albuquerque, N. Mex. 87110

Continuation-in-part of Ser. No. 720,244, Sep. 13, 1976, Pat. No. 4,057,289. This application Oct. 11, 1977, Ser. No. 840,668

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—327 **9 Claims**



1. In an against-the-wall type reclining chair having a base, a chair frame, a chair seat and a chair back, and reclining linkage means mounting at least one of said seat and said back upon said frame for movement relative to said frame between an upright position and a reclined position; the improvement comprising a pair of elongate spaced opposed parallel track members rigidly interconnected to each other and extending in a front to rear direction adjacent each side of said base, pivot means mounting said track members for pivotal movement relative to said base about a horizontal axis normal to the longitudinal extent of said track members, stop means engageable between said track members and said base establishing end limits of pivotal movement of said track members about said axis at a first limit wherein said track members are inclined downwardly and rearwardly relative to said base and a second limit wherein said track members are inclined downwardly and forwardly relative to said base, a chair frame supporting carriage mounted upon said track means for gravitationally induced movement longitudinally of said track means between a forward and a rearward end limit of movement in accordance with the direction in which said track members are inclined; the weight of an occupant of said chair normally maintaining said carriage at either end limit at which it may be located and said carriage being movable to the opposite end limit in a movement induced by a shifting of the weight of the occupant, and restraining means for preventing reclining movement of said back from said upright position when said carriage is at said rearward end limit of movement while accommodating reclining movement of said back when said carriage is at said forward end limit of movement.

4,128,274

ADJUSTING DEVICE FOR A SECTION OF A MEDICAL TREATMENT APPARATUS OR EXAMINING APPARATUS

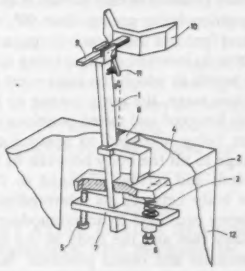
Walter Schmedemann, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,466

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609117

Int. Cl.[2] A47C *1/10*

U.S. Cl. 297—410 **10 Claims**



1. An adjusting device for medical apparatus, comprising an approximately vertical rail structure and a clamping structure, the rail and the clamping structure being movable, relative to each other, in the longitudinal direction of the rail, the apparatus being connected to one of said relatively movable structures the other of said relatively movable structures being stationary in space, comprising:

a movable clamping member which is connected to the clamping structure and whose movement, in the vertical direction, relative to the clamping structure is limited; and

spring means which function to bias the clamping member against the rail to produce a frictional force therebetween, the magnitude of said force being proportioned to prevent relative movement of said rail with respect to said clamping structure in response to the weight of said apparatus but to permit said relative movement when at least a predetermined downward force is exerted on said apparatus and to decrease the magnitude of said frictional force in response to upward motion of said apparatus.

4,128,275
TIPPING VEHICLE

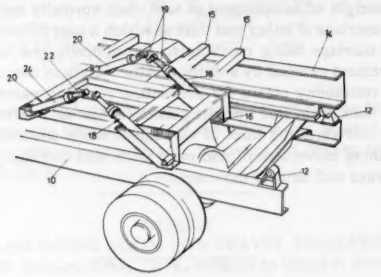
Otto A. H. Hansen, Germiston, South Africa, assignor to O.A.H. Homes (Proprietary) Ltd., South Africa

Continuation of Ser. No. 700,857, Jun. 29, 1976, abandoned. This application Sep. 1, 1977, Ser. No. 829,961

Claims priority, application South Africa, Aug. 8, 1975, 75/5124

Int. Cl.[2] B60P *1/16*

U.S. Cl. 298—19 B **8 Claims**



1. A tipping vehicle comprising a chassis; a body mounted on the chassis for tipping movement between a lowered position and a raised position about a tipping axis that is located towards the rear of the vehicle and is transverse to a longitudinal axis of the vehicle, and a main and an auxiliary extensible ram for tipping the body, the rams each being connected independently of the other between a point on the body and a point on the chassis with the connection point for the main ram to the chassis being closer to the tipping axis than is the connection point for the auxiliary ram to the chassis, and with the rams having opposite directions of slope with respect to the vertical when the body is in its lowered position, such directions being upwardly convergent and the included angle between such directions (viewed in side elevation of the vehicle) in such lowered position being greater than 90°, the points at which the rams exert force on the chassis during a first stage of tipping the body from its lowered position being spaced further apart than are the points at which the rams exert force on the body during the same stage, the body having an intermediate position between its lowered and raised positions and the main and auxiliary rams being arranged to apply force together during an initial stage to tilt the body between its lowered and intermediate positions and further arranged so that only the main ram tilts the body between its intermediate and raised positions, means being provided to accommodate lost motion between the auxiliary ram and the body as the body is tilted between its intermediate and raised positions, both the main and the auxiliary rams being conventional piston-and-cylinder combinations each having in its cylinder a single piston and rod.

4,128,276
HIGH-RELIABILITY AIR BRAKE SYSTEM PROVIDING A PLURALITY OF OPERATIONAL MODES

Henry E. Beck; Jimmie L. Hasten, both of Oswego, and Ernest C. Sindelar, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 695,879, Jun. 14, 1976, Pat. No. 4,063,624. This application Sep. 30, 1977, Ser. No. 838,284

Int. Cl.[2] B60T *13/38*

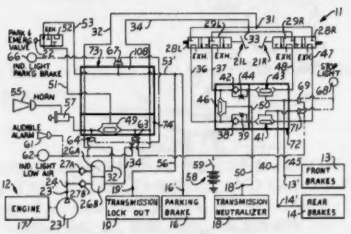
U.S. Cl. 303—13 **3 Claims**

3. A modular circuit component assembly for an air brake system comprising:

first and second juxtaposed module bodies having adjacent surfaces and each having an opposite surface;

said first module body having a pair of parallel spaced apart first flow passages extending from said adjacent surfaces to said opposite surface thereof and each having a diametrically enlarged region, said first module body further having a second flow passage extending from a region of said adjacent surfaces situated between said first flow passages to a different surface of said first module body, and still further having a pair of outlet passages each communicating with the central portion of said enlarged region of a separate one of said first flow passages;

said second module body having a pair of parallel spaced apart third flow passages extending from said adjacent surfaces to said opposite surface thereof in alignment with said first flow passages, said second module body having a



fourth flow passage extending between said pair of third flow passages and having a diametrically enlarged portion therebetween, said second module body having a fifth flow passage extending from the central portion of said enlarged region of said fourth flow passage to said adjacent surfaces in alignment with said second flow passage; and

first and second shuttle valve members each being disposed in said enlarged region of a separate one of said first flow passages for axial movement therein, and a third shuttle valve member disposed in said enlarged region of said fourth flow passage for axial movement therein.

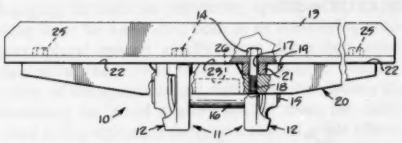
4,128,277
LATERAL STIFFENER FOR TRACK SHOES

Thomas C. Meisel, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 2, 1977, Ser. No. 802,614

Int. Cl.[2] B62D *55/28*

U.S. Cl. 305—54 **13 Claims**



1. A track assembly comprising

a pair of laterally spaced and articulated link assemblies each comprising a plurality of pivotally interconnected links,

a track shoe disposed on a laterally spaced pair of links of said link assemblies,

at least one stiffening means extending across said track shoe,

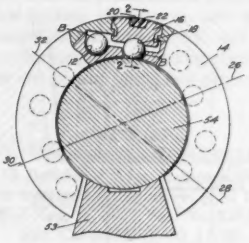
releasable fastening means extending through said track shoe and through each of said pair of links and releasably secured to said stiffening means for releasably securing said track shoe, links and stiffening means together, and

means defining a pair of longitudinally spaced notches in said stiffening means, each of said notches having a bridging portion of a respective one of said pair of links accommodated therein and maintained in clamped relationship between said stiffening means and said track shoe by said fastening means.

4,128,278
LINEAR MOTION BALL BEARING WITH DYNAMIC STIFFNESS

William E. Headen, East Greenwich, and George N. Levesque, Warwick, both of R.I., assignors to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Filed Aug. 30, 1977, Ser. No. 829,131
Int. Cl.² F16C *17/00*
U.S. Cl. 308—3 A **3 Claims**

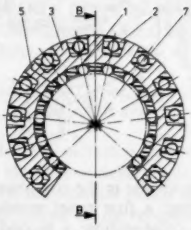


1. A linear motion ball bearing for axial movement along a shaft having a ball retainer member with a plurality of raceways therein, each raceway having recirculating ball bearing members therein comprising a load-bearing portion and a load-free portion, said member surrounding a shaft and being mounted in a housing having a cylindrical bore, a load bearing plate associated with the load bearing portion of each raceway, each load bearing plate having an intermediate thicker portion which contacts said housing, characterized in that a longitudinal strip of elastomeric material is mounted longitudinally in a recess of the outer peripheral surface of each load bearing plate, said strip and thicker portion of said load bearing plate contacting the bore of said housing, the balls being preloaded in the housing by contact of the thicker portion therewith with a diametrical squeeze factor of between 0.0017 and 0.0022 inch, the elastomeric material being squeezed on the order of 0.005 inch.

4,128,279
LINEAR MOTION BALL BEARINGS

Horst M. Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt; Manfred Brandenstein, Aschfeld, and Toni Schulz, Dittelbrunn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 845,227
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649245
Int. Cl.² F16C *29/06*
U.S. Cl. 308—6 C **13 Claims**

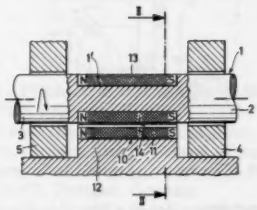


1. In a linear-motion ball bearing formed generally as a cylinder having a plurality of circumferentially spaced endless ball races and included balls, each race having an axial load zone, an axial return zone radially outward of said load zone, these load and return zones having adjacent ends, and turn-around zones connecting the ends of said load and return zones, the improvement wherein the bearing comprises a cylindrical shell having a bore surface along which are defined said load zones, a pair of spaced guide walls extending axially along and adjacent each load zone and extending generally radially inward for guiding balls in said load zone, and wherein said return and turn-around zones are respectively axial and curved guide channels for the balls, and said axial guide walls and axial and curved guide channels comprise abrasion-resistant plastic injection-molded onto said bearing shell, the curved guide channels each having an open part facing axially outward, and said bearing further comprising means for covering said open parts and securable thereto.

4,128,280
SELF-PRESSURIZING FLOATING GAS BEARING HAVING A MAGNETIC BEARING THEREIN

Werner Purtschert, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 18, 1977, Ser. No. 769,966
Claims priority, application Switzerland, Jan. 17, 1977, 515/77
Int. Cl.² F16C *39/04, 39/06*
U.S. Cl. 308—9 **15 Claims**

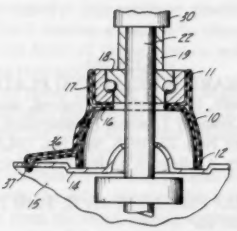


1. A self-pressurizing floating gas bearing comprising
a support body having a first bearing surface thereon;
a bearing body having a second bearing surface facing said first bearing surface, said bearing body being movably mounted with respect to said support body; and
an auxiliary permanent-magnet bearing forming a magnetic field to at least compensate the weight of said bearing body whereby, said bearing body exerts no pressure or only a negligible pressure on said first bearing surface.

4,128,281
AUXILIARY AXIAL THRUST BEARING APPARATUS

Stephen A. Batkiewicz, 5742 Beechview Dr., Rochester, Mich. 48063

Filed Apr. 21, 1977, Ser. No. 789,573
Int. Cl.² F16C *35/04, 19/06*
U.S. Cl. 308—15 **9 Claims**



1. Easily mountable and removable auxiliary axial thrust bearing apparatus for assembly with a bearing housing having a shaft projecting therefrom at at least one end to attach a load

member thereon at one end of the shaft, comprising a case having opposite ends;

one said end of said case being abuttable on the housing associated with the shaft to be supported;

the other end of said case having walls forming a bearing socket;

an axial thrust bearing mounted in said walls of said socket; and

means for impinging axial thrust on said bearing from the load member secured to the shaft;

axial thrust on the shaft toward the housing being axially supported by said means, said bearing and said case.

4,128,282

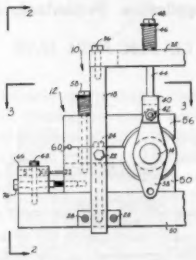
COUNTERBALANCE BEARING ASSEMBLY

John R. Bost, Laurens, S.C., assignor to Byars Machine Company, Laurens, S.C.

Filed Dec. 5, 1977, Ser. No. 857,269

Int. Cl.[2] F16C *13/00*

U.S. Cl. 308—20 **4 Claims**



1. A counterbalance bearing assembly for supporting and positively positioning an end of a cylinder which has a shaft extending axially therefrom comprising:

a first bearing having a bore extending therethrough through which an end of said shaft extends;

movable means for supporting said first bearing and in turn said cylinder with said shaft extending therethrough;

a guide bearing assembly directly engaging said cylinder and positively positioning said cylinder, said guide bearing assembly including:

(i) a lower block having an arcuate-shaped surface thereon;

(ii) a layer of material having a low coefficient of friction carried on said arcuate surface upon which said cylinder is carried;

(iii) an upper block having an arcuate-shaped surface thereon engaging said cylinder from a top side, and

(iv) means for adjustably moving said lower block for positively positioning said cylinder,;

whereby the majority of the weight of said cylinder is supported by said first bearing while said guide bearing assembly positively positions said cylinder.

4,128,283

BEARING RETAINING PLATE

Clifford A. Palmer, Huddersfield, England, assignor to Holset Engineering Company Limited, Huddersfield, England

Filed Nov. 23, 1976, Ser. No. 744,374

Claims priority, application United Kingdom, Nov. 25, 1975, 48323/75

Int. Cl.[2] F16C *33/10, 19/32;* F04B *39/02*

U.S. Cl. 308—237 R **4 Claims**

1. A rotatable assembly comprising:

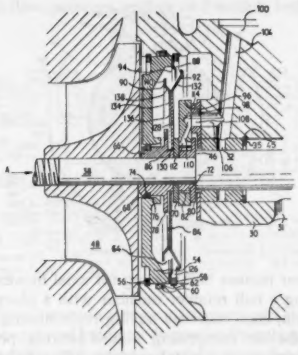
a rotatable shaft,

at least one rotatable fluid lubricated sleeve bearing supporting said shaft for rotation,

a bearing housing having an end face and a circular aperture receiving said bearing,

restraining means positioned within said housing circular aperture and adjacent a first end of said bearing for restraining axial movement of said bearing in one direction, said restraining means being in contact over a given area with the first end face of said sleeve bearing,

a retaining plate fixed on said housing end face adjacent a second end of said bearing for restraining axial movement of said bearing in the opposite direction, said plate having



a single aperture comprising a first circular aperture through which said shaft extends and a plurality of apertures extending radially outward from said first aperture to permit passage of fluid from the second end of said bearing and to define a plurality of inwardly projecting fingers, said fingers restraining axial movement of the second end of said bearing, said fingers being in contact with the second end of the bearing over an area which is equal to the contact area of said restraining means with the first end of the bearing.

4,128,284

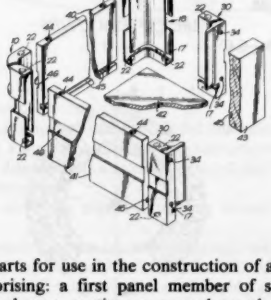
CONSTRUCTION OF ARTICLES OF FURNITURE

Peter G. King, Wirral, England, assignor to Mackenzie King Holdings Limited, Chester and Formica Limited, London, both of, England

Filed Mar. 31, 1977, Ser. No. 783,313

Int. Cl.[2] A47B *88/00, 47/00*

U.S. Cl. 312—330 R **8 Claims**



1. A set of parts for use in the construction of an article of furniture comprising: a first panel member of substantially constant external cross-section; a second panel member of substantially constant external cross-section; a first connecting device for attachment to said panel members respectively in a manner to secure said panel members together at an angle to one another; a first socket on the connecting device having an internal cross-section which substantially conforms with at least a major part of the cross-section of the first panel member

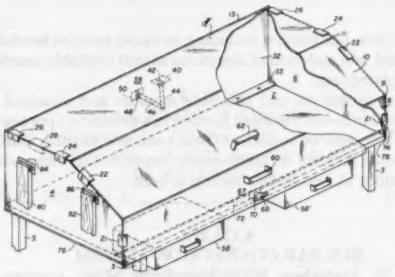
whereby an end portion of said first panel member may be received in said first socket; retention means for retaining said end portion within said first socket and comprising resiliently inter-engageable locking elements on said end portion and within said first socket respectively; a second socket on the connecting device set at an angle to said first socket, the internal cross-section of the second socket substantially conforming with at least a major part of the cross-section of said second panel member so that an end portion of said second panel member may be received in said second socket, and resiliently inter-engageable locking elements on said end portion and within said second socket respectively, said elements being arranged in similar manner to the locking elements on said first socket and said end portion of the first panel member.

4,128,285

THEFT-PROOF TABLE-TOP ENCLOSURE

Nicola Lore, 35 Burkhardt Ave., Bethpage, N.Y. 11714, and Lino Di Meo, 6 Kings Ct., Plainview, N.Y. 11803

Filed Aug. 16, 1977, Ser. No. 825,086
Int. Cl.[2] A47B *19/10, 37/00*
U.S. Cl. 312—196 **8 Claims**



1. A theft-proof collapsible enclosure for a table-top working area comprising a plurality of panels disposed, in closed condition of the enclosure, in separate mutually intersecting planes in a position above the table-top working area, said plurality of panels forming a top wall, a front wall and two side walls of the enclosure in said closed condition thereof, the panels of at least said top wall and said front wall being pivotable about respective substantially horizontal axes at the mutual intersections thereof so as to collapse the enclosure, said panels forming said side walls being pivotable about respective substantially horizontal axes at the mutual intersections of said panels forming said side walls with said separate planes of the remainder of said plurality of panels.

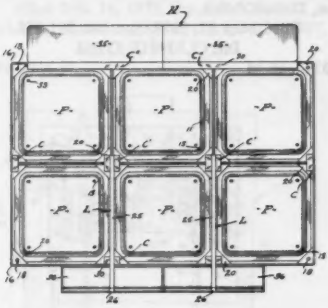
4,128,286

PORTABLE DISPLAY WALL

Robert E. Windisch, 28652 Acacia Glenn, Agoura, Calif. 91301, and George R. Hartz, 8131 McNulty Ave., Canoga Park, Calif. 91306

Filed Aug. 12, 1977, Ser. No. 823,974
Int. Cl.[2] A47B *81/00*
U.S. Cl. 312—234 **8 Claims**

1. A portable display wall including, a multiplicity of seperable and substantially identical modular panels having rectangular frames for rigidity, the modular panels having means carried within the frames thereof for the reception of graphics and articles for display, there being at least three of said modular panels in side by side relation with the frames thereof nested corner to corner in coplanar relation, at least a pair of leg members and each comprised of a fore and aft foot for support plane engagement and a column extending vertically therefrom to coextensively overlie a line of joinder between adjoining side frame members of adjacent modular panels, and a coupling plate overlying each line of joinder between the upper and lower nested corners respectively and fixed to said



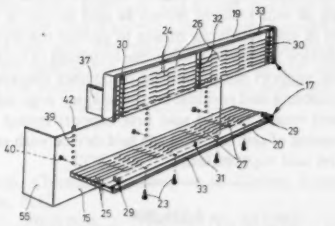
column to receive fastener means entered into adjoining side frame members.

4,128,287

HOUSEHOLD APPLIANCE WITH A BASE SETBACK ON THE FRONT SIDE THEREOF

Friedhelm H. Loch, Munich; Hans Mailänder, Heidenheim; Heinz Riemath, Giengen; Richard Schmid, Giengen, and Ernst Stickel, Giengen, all of Germany, assignors to Bosch-Siemens Hausgerate GmbH, Stuttgart, Germany

Filed Jun. 1, 1977, Ser. No. 802,552
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2626202
Int. Cl.[2] A47B *91/02*
U.S. Cl. 312—253 **10 Claims**



1. In a housing appliance, such as a dishwasher, washing machine, stove and the like, with a base setback on the front thereof, the improvement comprising:

(a) a base setback having a vertically disposed base plate parallel to the front of the appliance, and facing means composed of two separate wall plates

(b) said two wall plates disposed at right angles to each other with one wall plate disposed in the plane of the front of the appliance and the other wall plate secured to the lower edge zone of the first wall plate

(c) the second wall plate extending parallel to the base of the appliance with the edge zone of the second wall plate facing away from the front, resting against said vertically disposed base plate, and

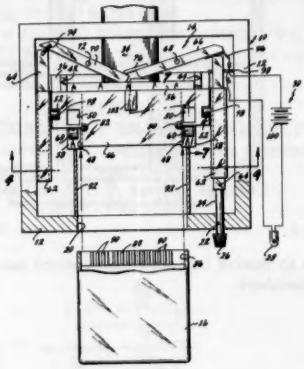
(d) said vertically disposed base plate being movable in planes parallel to the front side of the appliance to permit moving said base plate against said edge zone of the second wall plate.

4,128,288

ZERO INSERTION/RETRACTION FORCE CONNECTOR

Clyde Zachry; Paul K. White, both of Poway, and Wilbur T. Layton, San Diego, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 27, 1977, Ser. No. 801,155
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—45 M **8 Claims**



1. A zero insertion/retraction connector for connecting terminal conductors of an electronic device to other electronic devices comprising,

means for receiving the device,

actuable means in said receiving means including:

means supporting a first set of electrical conductor terminals,

means supporting a second set of electrical conductor terminals,

resilient means for urging said second support means towards said first support means when said device is absent from said receiving means,

means for displacing said second support means against the urging of said resilient means as said device is being inserted in said receiving means to permit the terminals of said device to move between the terminals of said first and second support means but out of contact therewith, and

means enabling said resilient means to again urge said second support means toward said first support means to effect the mating of said terminals on said device with said terminals on said support means.

4,128,289

ELECTRICAL CONNECTOR HAVING A LOW INSERTION FORCE FOR FLAT CIRCUIT BEARING ELEMENTS

Carl Occhipinti, Melrose Park, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 415,147, Nov. 12, 1972, abandoned. This application May 23, 1975, Ser. No. 580,457
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 MP **5 Claims**

1. An electrical connector comprising:

an insulating housing including a base, a rotatable member including an elongate front portion and a rear portion rotatably mounted on said base enabling said rotatable member to be rotated in first and second directions about said base, and a contact-receiving cavity extending rearwardly through said base and forwardly through said rotatable member,

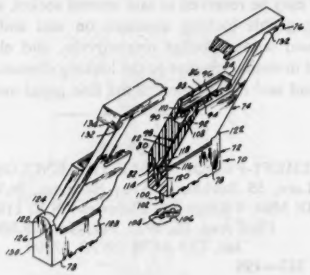
said cavity including a transversely enlarged portion extending longitudinally between said base and said rotatable member;

at least one metallic contact mounted in said cavity, said metallic contact including

a rear tail portion extending rearwardly through said base for connection to an external conductive element,

an active portion diposed frontwardly in said rotatable member for engagement with a mating contact, and

an intermediate portion including a one-piece flat ribbon-like portion disposed in said enlarged portion in transverse spaced relation to said base and said rotatable member,



said ribbon-like portion including an upper portion bendable in said first and second directions as said rotatable member is rotated; and

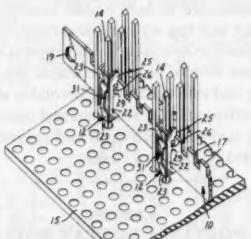
bending means on said rotatable member and arranged to extend into said enlarged portion in a direction opposite to the direction of rotation of said rotatable member during rotation thereof to transversely support said ribbon-like portions as said upper portion is bent.

4,128,290

BUS BAR CONNECTION SYSTEM

Norman W. Mickelson, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 8, 1978, Ser. No. 875,989
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—97 R **4 Claims**



1. A system for electrical connection between an electrical terminal post and a common conductor comprising:

a bus bar comprising a conductive band coated with an electrically insulating material, and

a conductive contact clip for connection to said conductive band to permit conductive connection between said bus bar and a terminal post, said clip comprising a generally U-shaped body with parallel side walls joined by a base wall; said side walls being similarly formed, each side wall having an arm extending away from said base wall and then parallel to said base wall to define a slot parallel to said base wall, a pair of insulation piercing projections adjacent the entrance to said slot and spaced to scrape the insulation from said bus bar as it is moved into said slot,

and a shoulder extending away from said base wall to a position spaced from and opposed to the entrance to said slot, said extension being spaced from the closed end of said slot a distance generally equal to the width of said bus bar; and said base wall being formed with a resilient lever arm extending into the space between said side walls for contacting a terminal post inserted between said side walls,

whereby said bus bar may be inserted into said slots in said side walls of said contact clip to a position generally parallel to said base wall of said clip, said insulation piercing projections scraping insulation from said bus bar to electrically connect said clip to said bus bar and the space encompassed by said bus bar and said U-shaped body of said clip forming a receptable for a terminal post, said resilient lever arm extending into said receptacle to contact a terminal post therein and thereby make electrical connection from the terminal post to said bus bar through said clip.

4,128,291

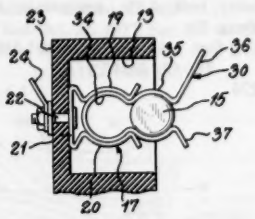
FUSE ADAPTER TERMINAL

Richard J. Peterson, Jr., 372 Burnet Pl., Paramus, N.J. 07652

Filed Nov. 16, 1977, Ser. No. 851,854

Int. Cl.[2] H01H *85/22*

U.S. Cl. 339—154 A **6 Claims**



1. A fuse adapter terminal for fuse holders of the type having a pair of spaced-apart spring clips which are adapted to receive the ends of a cylindrical fuse comprising

a substantially U-shaped member of electrically-conductive resilient material, said member having

a pair of oppositely-disposed leg portions,

an outwardly-extending arcuate central portion joining one end of each of said leg portions, and

an outwardly-extending male spade connector on the other end of one of said leg portions for receiving a female connector thereon,

each of said leg portions having first and second outwardly-extending lobes disposed along the length thereof, the first lobes of said leg portions being adjacent said arcuate central portion and cooperating therewith to form an arcuate surface which is adapted to be disposed in a spring clip of the fuse holder, the second lobes of said leg portions being adjacent the other end of the leg portions and cooperating with each other to receive the end of the fuse therebetween,

whereby the ends of the fuse are mechanically supported by and electrically connected to the spring clips of the fuse holder and said male spade connector functions as an auxiliary terminal to permit connection of an auxiliary circuit to the fuse holder.

4,128,292

RIGHT-ANGLE ELECTRIC CONTACT PLUG

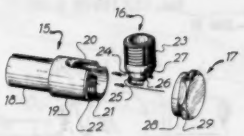
Leon Mouttet, Lonay, Switzerland, assignor to Interlemo Holding, S.A. c/o Curia Treuchand A.G., Coire, Switzerland

Filed Feb. 16, 1978, Ser. No. 878,282

Claims priority, application Switzerland, Jul. 6, 1977, 8318/77

Int. Cl.[2] H01R *13/00*

U.S. Cl. 339—176 R **3 Claims**



1. Right-angle electric contact plug whose right-angle body comprises a first tubular part comprising at least one removable electric contact element and a radial end notch, a second tubular part opening into the radial notch of the first part and having a clamping gripper intended to hold an electric connecting conductor, and a removable closure element fastened on at least one of the two parts of the right-angle body and intended to close the notched end of the first part of said right-angle body after connection of the electric conductor with the electric contact element, characterized by the fact that the two parts of the body are removable, by the fact that the two edges of the radial notch of the first part of the body are shaped as a slideway, by the fact that the base of the second portion of the body is shaped as a slide, by the fact that the notched end of the first part of the body is threaded, and by the fact that the closure element of the said notched end is a threaded plug, so that after connection of the electric conductor with the electric contact element, said contact element is introduced into the first part of the body at the same time as the slide of the second part of the body is engaged in the slideway of the notch of the first part, and by the fact that finally the threaded closure plug is screwed and clamped on the threaded end of said first part, thus rigidly assembling the two parts of the body by locking the slide of the second part against the bottom of the slideway of the notch of the first part.

4,128,293

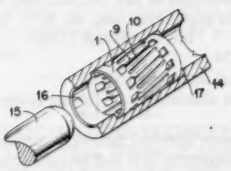
CONDUCTIVE STRIP

Alfred Paoli, Chicago, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Nov. 2, 1977, Ser. No. 847,992

Int. Cl.[2] H01R *13/12*

U.S. Cl. 339—258 R **9 Claims**



1. A conductive strip for providing electrical contact between a pin and socket in an electrical connector comprising: an elongated metallic strip, said strip having a plurality of substantially elongated parallel fingers projecting away from at least one surface of said strip; said fingers having two sides; one side of said fingers being attached to and integral with said

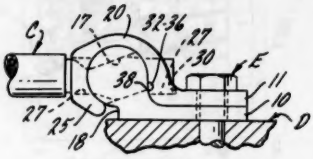
strip; the unattached side of said fingers forming an edge adapted to contact a pin or a socket; the longest dimension of said edge of said fingers being at an oblique angle with respect to the longest dimensional side of said strip.

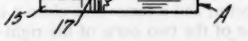
4,128,294

CABLE CLAMPS

Daniel McCord, Geneva, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Dec. 19, 1977, Ser. No. 861,875
Int. Cl.[2] H01R *9/10*
U.S. Cl. 339—266 R **3 Claims**





1. In a cable clamp including a male jaw member having a trunnion-like head formed with a cable-receiving bore, said clamp also including a female jaw member having a yoke presenting an internal socket shaped complemental to said head, and with a cable-receiving bore formed in the yoke, whereby the head and yoke may be interfitted for movement of the jaw members between an open position where the bores are aligned to enable the cable to pass therethrough and a closed position where the bores are misaligned to crimp the cable, the improvement comprising a raised rib on one of the members projecting toward the other member with an end portion of the rib swaged inward toward the bore of the related member to afford a protuberance thereon of greater height than the remainder of the rib, a notch in the other member opposed to said protuberance, the notch presenting a lip which rests on the protuberance to hold the members in open position, the protuberance yielding to movement of the lip therepast to allow the jaws to be closed by a closing force applied to the members.

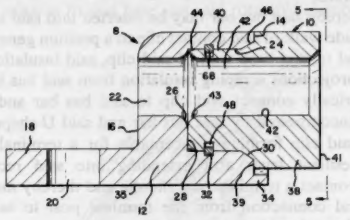
4,128,295

ECCENTRIC BORE CONNECTING DEVICE

Edward D. Bunnell, Palm Harbor, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 683,994, May 6, 1976, abandoned. This application Aug. 10, 1977, Ser. No. 823,303
Int. Cl.[2] H01R *11/02*
U.S. Cl. 339—274 **10 Claims**

8. An electrical interconnection
comprising: an aluminum wire further comprising a plurality of strands,
and an aluminum terminal further comprising first and second body members, first and second adjacent portions of said aluminum wire being received respectively by said first and second body members, said plurality of strands being inelastically deformed to establish intimate contact among said strands,
and between said strands and said first and second body members at an interface between said first and second body members,
said first body member comprising a generally cylindrical plug member generated around a first axis with a first eccentric bore having a second axis offset from said first axis, for receiving said first portion of said aluminum wire,
said second body member having a generally cylindrical cavity generated about a third axis for receiving said cylindrical plug member with said first axis and said third axis in alignment, and a second eccentric bore having a fourth axis offset from said third axis for receiving said



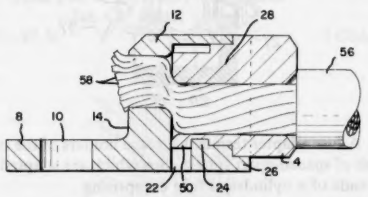
second portion of said aluminum wire when said first axis is aligned with said fourth axis, said first member being rotatable relative to said second member to offset said first and second eccentric bores and subject said aluminum wire to transverse and rotational shear stress exerted by the inner surfaces of said first and second eccentric bores to inelastically deform said aluminum wire and to establish intimate contact at said interface.

4,128,296

ECCENTRIC BORE ELECTRICAL CONNECTING DEVICE

John H. Lauterbach, Clearwater, and Frederick W. Rossler, Jr., New Port Richey, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 7, 1977, Ser. No. 831,328
Int. Cl.[2] H01R *11/02*
U.S. Cl. 339—274 **7 Claims**



1. An electrical connector assembly, for use with an electrical conductor, consisting of a male connector member and a female connector member mutually rotatable between a first and a second position:
(a) said male connector member comprising a male body cast from an electrically conductive material and further comprising:
(i) a plug member generated around a plug axis,
(ii) a bore extending through said male connector member, the axis of said bore being offset from said plug axis,
(iii) an annular ridge extending around at least a portion of the exterior of said plug member,
(b) said female connector member comprising a female body cast from an electrically conductive material and further comprising:
(i) a bore in said female body extending partially therethrough,
(ii) plug receiving means extending from a first side of said female body and merging with said bore, said plug

receiving means having a cross-section generally larger than the cross-section of said bore,

(iii) a channel extending at least partially around said plug receiving means and extending inwardly from a second side of said female body, said channel extending transversely of said bore,

(c) said assembly having said plug member in said plug receiving means with the axis of said bore through said male connector member being in alignment with the axis of said bore through said female body when said assembly is in said first position and offset therefrom when said assembly is in said second position, said annular ridge on said plug member being received within said channel during rotation of said male and female members from said first to said second position, to prevent relative axial movement, whereby,

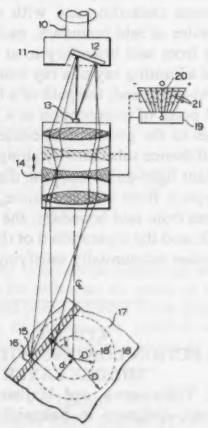
said electrical conductor may be positioned within said aligned bores when said assembly is in said first position and mechanical and electrical contact can be established with said conductor by rotation of said male and female connector members to said second position.

4,128,297

VARIABLE LEAD OPTICAL TRACING MACHINE WITH SCANNING AND VARI-FOCAL LENS

Arnold H. Bourne, Hamilton, Canada, assignor to Westinghouse Canada Limited, Hamilton, Canada

Filed Oct. 25, 1977, Ser. No. 844,873
Claims priority, application Canada, Feb. 23, 1977, 272442
Int. Cl.[2] G01B *27/17*
U.S. Cl. 350—6.1 **2 Claims**



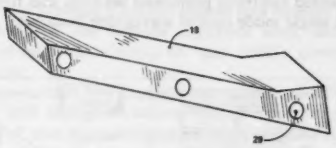
1. A circular scanning optical pattern tracer including a vari-focal lens in the optical system, whereby the diameter of the scanning circle may be varied by adjustment of the vari-focal lens, including a kerf offset control and adjustable scale therefor, and a means of coupling the adjustable scale and the vari-focal lens adjustment whereby variations of the lead adjusts the kerf offset scale in such a manner that the kerf offset scale maintains calibration when the diameter of the scanning circle is varied.

4,128,298

WAND NOSE WITH INTEGRAL LIGHT PIPE FOR WAND POWER TURN-ON

Robert M. McMillan, Dallas, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Dec. 27, 1976, Ser. No. 754,860
Int. Cl.[2] G02B *5/14*; G06K *7/10*
U.S. Cl. 350—96.10 **4 Claims**



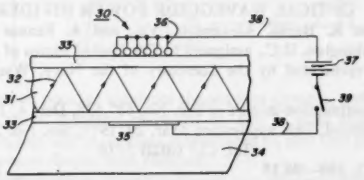
1. A light conductor comprising an elongated homogeneous plastic material of generally rectangular cross section at one end and along the principal length of the conductor and an enlarged cross section at the end opposite said one end, a plurality of mounting members homogeneous with said conductor and extending from two opposite non-adjacent sides of the conductor and a mirror finish on the surface of said conductor which is equivalent to at least a **16** microinch finish.

4,128,299

WAVEGUIDE OPTICAL MODULATOR

James Maher, Sodus, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 12, 1977, Ser. No. 796,262
Int. Cl.[2] G02B *5/14*; G02F *1/29*
U.S. Cl. 350—96.13 **16 Claims**



1. A method for modulating light propagating in a waveguide, the waveguide having on at least one surface a deformable cladding of a material having a lower index of refraction than the waveguide, the cladding having a thickness at least equal to the exponential depth of the evanescant field of the propagating light, the waveguide and cladding being positioned between a pair of electrode means, the method comprising impressing a field between the electrode means in order to attract the electrodes towards each other so that the cladding is deformed to a degree sufficient to interfere with the evanescant field of the propagating light, whereby propagation of the light is modulated.

4,128,300

OPTICAL LOGIC ELEMENTS

Larry B. Stotts, Chula Vista; William E. Martin, Pleasonton, and Paul S. Catano, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 26, 1977, Ser. No. 836,265
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.14 **12 Claims**

1. An optical logic element comprising:

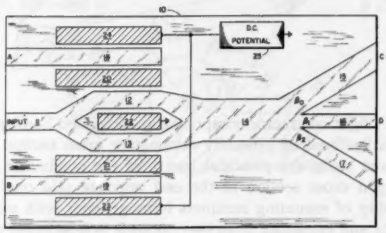
an input optical waveguide for transmitting single mode optical energy, and diverging into first and second single

mode optical waveguide branches of equal optical length which reconverge at a multi-mode optical waveguide;

first, second, and third output optical waveguides connecting in common to said multi-mode optical waveguide for propagating lowest order, first order and second order modes of light energy, respectively;

first and second photoconductive paths disposed outside and spaced from said first and second single mode optical waveguide branches, respectively;

a grounded electrode positioned between said first and second single mode optical waveguide branches;



an electrode positioned between said first single mode optical waveguide branch and said first photoconductive path;

an electrode positioned between said second single mode optical waveguide branch and said second photoconductive path; and

means for impressing a dc electric field across said optical waveguide branches, photoconductive paths, and electrodes.

4,128,301

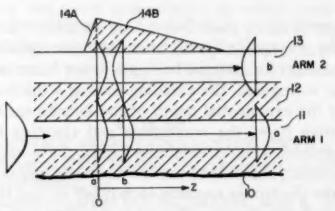
OPTICAL WAVEGUIDE POWER DIVIDER

William K. Burns, Alexandria, Va., and A. Fenner Milton, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 637,628, Dec. 4, 1975, abandoned. This application Mar. 29, 1977, Ser. No. 782,571

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.15 **3 Claims**



1. An optical waveguide power divider which comprises:

a substrate formed of optical material;

a first optical waveguide located on said substrate and formed of an optical material having an index of refraction greater than said substrate;

a second optical waveguide with thickness and index of refraction substantially equal to those of said first optical waveguide;

a layer of optical material separating said first optical waveguide from said second optical waveguide with an index of refraction substantially equal to that of said substrate; and,

an overlay on said second waveguide with an index of refraction substantially equal to said substrate and with a fast taper, sufficiently steep to cause mode conversion, and a slow taper, sufficiently slow to allow adiabatic propagation, both tapers sloping in the direction of the length of said optical waveguides, said tapered overlay being sufficiently thick at its thickest part where said tapers meet to confine below its upper boundary the fields of the modes of said coupled waveguides.

4,128,302

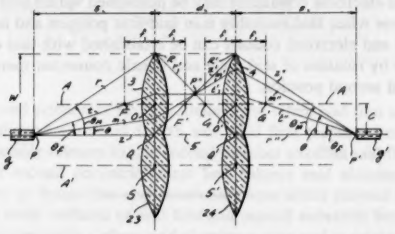
RAY-PATH EQUALIZER FOR SIGNAL TRANSMISSION VIA MULTIMODE OPTICAL WAVEGUIDES

Pietro Di Vita, Turin, Italy, assignor to SELT-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Mar. 21, 1977, Ser. No. 779,821

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.18 **7 Claims**



1. In an optical signal-transmitting system, in combination:

two aligned light guides with confronting ends respectively emitting and collecting bundles of light rays whose limiting rays include a critical angle with a common centerline of said light guides in at least one longitudinal plane of symmetry thereof; and

an equalizer between said light guides comprising two identical transparent bodies of positive refractivity spaced apart from each other and from said confronting ends along said centerline, each of said bodies having a cross-section in said plane of symmetry consisting of two symmetrical truncated lens profiles with a boundary lying on said common centerline and with optical axes lying on opposite sides of said boundary, each of said lens profiles extending from said boundary to at least a point of interception of a limiting ray of a ray bundle converging at the closer light-guide end, the path of a limiting ray extending from said point of interception at a lens profile of one of said bodies to the geometrical center of the other of said bodies and thence substantially along said centerline to the more distant light-guide end; the distance w of said point of interception from said centerline, the spacing c of said optical axes from said boundary, the focal length f of each lens profile and the separation d of the geometrical centers of said bodies substantially satisfying the relationship $w/c = d/f$.

4,128,303

ANTI REFLECTION COATING WITH A COMPOSITE MIDDLE LAYER

Fumio Onoki, Tokorozawa, and Hajime Kamiya, Kokubunji, both of Japan, assignors to Kabushiki Kaisha Hoya Lens, Tokyo, Japan

Continuation-in-part of Ser. No. 673,889, Apr. 5, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 790,005

Int. Cl.[2] G02B *5/28*

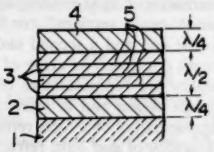
U.S. Cl. 350—164 **6 Claims**

1. An anti-reflection optical glass including glass having sequentially coated thereon a plurality of layers, each layer having a thickness expressed as a fraction of a predetermined wavelength (λ) consisting essentially of:

(a) a medium refractive index layer selected from the group

consisting of CeF_3 and Al_2O_3 having a thickness of about ¼ λ;

(b) four sequential high refractive index layers, each of said layers selected from the group consisting of TiO_2, CeO_2 and ZrO_2;



(c) three thin layers of MgF_2 having a thickness of about 10 to about 100A, each of said thin layers interposed between said high refractive index layers (b) and spaced apart from each other at a distance of ¼ λ, the plurality of layers (b) and (c) being about ¼ λ in overall thickness; and

(d) a low refractive index layer of MgF_2 having a thickness of ¼ λ on top of the plurality of layers (b) and (c).

4,128,304

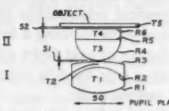
ABBE CONDENSER

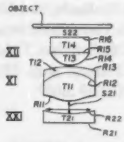
Milton H. Sussman, Amherst, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 24, 1975, Ser. No. 643,980

Int. Cl.[2] G02B *3/04, 9/12, 9/06*

U.S. Cl. 350—189 **12 Claims**





1. A two-component microscope condenser having a working distance effective for either an air space or oil filled space and having a front pupil plane external to the glass thereof, said condenser consisting of a biconvex positive doublet and a convex-plano positive doublet aligned along an optical axis.

4,128,305

CATADIOPTRIC OBJECTIVE

Wai-Min Liu, Rosemead, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 594,426, Jul. 9, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,677

Int. Cl.[2] G02B *17/08*

U.S. Cl. 350—201 **2 Claims**

1. A catadioptric objective lens system having a front end, a rear end, and a principal optical axis, comprising:

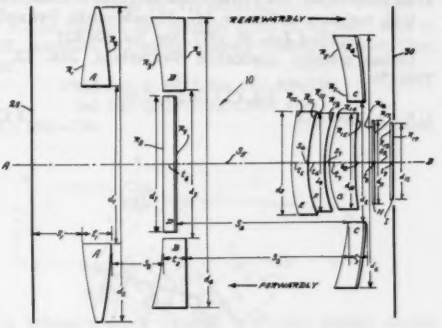
a. a double convex lens element, having a centrally located opening, which is axially aligned with said principal optical axis of said system;

b. a double concave lens element having a centrally located opening, with said double concave lens element disposed rearward of, and in axial alignment with, and also in spaced-apart relationship to, said double convex lens element;

c. a negative meniscus shaped lens element, concave and reflective to the front, having a centrally located opening, with said negative meniscus shaped lens element disposed rearward of, and in axial alignment with, and also in spaced-apart relationship to, said double concave lens element;

d. a plano-convex lens element, convex and reflective to the rear, with said plano-convex lens element disposed forward of, and in axial alignment with, and also in spaced-apart relationship to, said concave front negative meniscus shaped lens element;

e. a first positive meniscus shaped lens element, convex to the front, disposed rearward of, and in axial alignment with, and also in spaced-apart relationship to, said plano-convex lens element;



f. a second positive meniscus shaped lens element, convex to the front, disposed rearward of, and in axial alignment with, and also in abutting relationship to, said first positive meniscus shaped lens element;

g. a third positive meniscus shaped lens element, convex to the front, disposed rearward of, and in axial alignment with, and also in spaced-apart relationship to, said second positive meniscus shaped element, with this said third positive meniscus shaped lens element also simultaneously disposed partly within said centrally located opening of the said concave front negative meniscus shaped lens element and partly forward of this same said lens element;

h. a first parallel plate lens element disposed rearward of, and in axial alignment with, and also in spaced-apart relationship to said third positive meniscus shaped lens element and to said concave front negative meniscus shaped lens element having a centrally located opening

i. and, a second parallel plate lens element disposed rearward of, and in axial alignment with, and also in spaced-apart relationship to, said first parallel plate lens element.

4,128,306

OPTICAL MAGNIFYING DEVICE

Fred Kempler, 5, avenue Maurice Barres, La Varenne, Val de Marne, France

Filed Nov. 29, 1976, Ser. No. 745,604

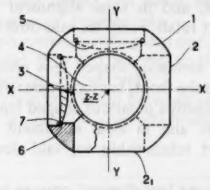
Claims priority, application France, Jan. 26, 1976, 76 02056

Int. Cl.[2] G02B *27/02*

U.S. Cl. 350—239 **4 Claims**

1. An optical magnifying device wherein there is an autonomous block carrying three perpendicular perforations extending completely through the block the axes of which intersect at

a point and carry magnifying lenses, enlarged recesses at one of the ends of each of said perforations and coaxial with the



perforations, said recesses each being adapted to receive a transparent base wherein the object to be studied is located.

4,128,307

DEVICE FOR CONTROLLING THE INCIDENCE OF HEAT AND LIGHT RADIATION, PARTICULARLY FOR GREENHOUSES AND THE LIKE

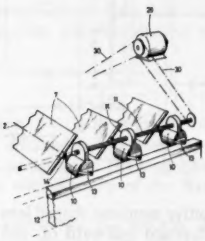
Hans Badertscher, and Walter Schindler, both of Basel, Switzerland, assignors to Plascon AG., Munchenstein, Switzerland

Filed Jun. 20, 1977, Ser. No. 808,421

Claims priority, application Switzerland, Jun. 22, 1976, 7989/76

Int. Cl.² G02B *27/00*

U.S. Cl. 350—263 **8 Claims**



1. A device for controlling the incidence of heat and light radiation on a growing area within greenhouses and the like comprising a plurality of slats of a non-self-supporting material arranged in parallel but side-by-side spaced relationship as in a Venetian blind, opposing pairs of means for supporting opposite ends of said slats and for tilting said slats about their longitudinal axes to open or close the slats, and means for rotating the opposing tilting means in synchronism, said tilting means including clamping means for contacting the opposite ends of each slat so as to maintain said slat in a substantially planar configuration, and tension means associated with each pair of tilting means to maintain the slat in tension as it rotates during the synchronous rotation of said opposing tilting means.

4,128,308

OPTICAL SYSTEM FOR CHANGING THE CROSS SECTIONAL DIMENSIONS OF A COLLIMATED BEAM OF LIGHT

Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041

Filed Apr. 14, 1977, Ser. No. 787,619

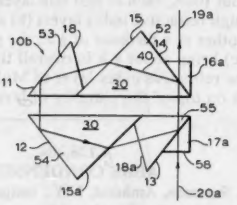
Int. Cl.² G02B *5/04*

U.S. Cl. 350—286 **3 Claims**

1. An optical system for effecting changes in a cross sectional dimension of a beam of light along an optical path therein extending from a light input path to said system to a light output path from said system, comprising:

a. means for directing a substantially collimated monochromatic beam of light along said optical path within the system so as to establish an availability of said beam at a plurality of locations along said optical path for an effecting of a change in a cross sectional dimensions of said beam at each said location, light refracting means coincident with each said location and each said location representative of a beam dimension control position of said system;

b. said means for directing the beam along said optical path including a formation of light conducting material having a predetermined cross sectional configuration, length dimension, a first end and a second end, and presenting along said length dimension an array of outer surfaces of which a plurality are representative of individual light reflecting surface means and at least one of said outer surfaces is representative of a light refracting surface for providing a plurality of said light refracting means along the length dimension thereof between said first and second ends;



c. each surface of said array of surfaces angularly oriented one with respect to the other so as to provide an optical relationship between said input path and each said control position and between each said control position and said output path, said optical relationship allowing said beam to follow said optical path forming a helix of plural revolutions, each revolution of said helix extended along said length dimension in a side-by-side relationship from said input path to said output path;

d. each revolution of said helix including at least one of said beam dimension control positions and said light refracting means at each said control position effecting said change in the cross sectional dimension of said beam in the direction substantially perpendicular to said length dimension of said array of surfaces.

4,128,309

AUTOMATIC OPTICAL FOCUSING DEVICE

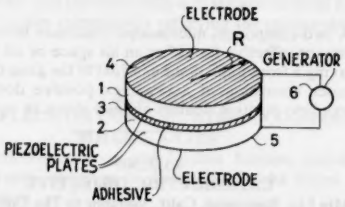
Jean-Claude Lehureau; Roland Malissin, and Gérald Roullet, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Aug. 16, 1976, Ser. No. 714,805

Claims priority, application France, Aug. 19, 1975, 75 25693

Int. Cl.² G02B *5/10*

U.S. Cl. 350—295 **7 Claims**



1. An automatic optical focusing device for moving the focusing spot of a radiation beam along the optical axis of said beam according to a control signal, said device comprising a reflecting element having two external faces, said reflecting element comprising two circular thin plates bonded together by a bonding material, at least one of said plates being formed with a piezoelectric preopolarized material, one of said exter-

nal faces being reflective, a convergent element for focusing said radiation beam reflected by said reflecting element at said focusing spot, and polarizing means for applying said control signal to said element, said control signal inducing an electrical field throughout the thickness of said prepolarized plate producing a radial deformation of said plate which deforms said element as a whole in curving said reflective face.

4,128,310

ZOOM MIRROR

John Miller, 2361 Cove Ave., Los Angeles, Calif. 90039

Continuation of Ser. No. 622,249, Oct. 14, 1975, abandoned. This application Jun. 6, 1977, Ser. No. 803,626

Int. Cl.[2] G02B *5/10*

U.S. Cl. 350—295 **4 Claims**

1. A variable focal length mirror comprising:

a resilient, deformable member having a reflective surface and being deformable into curved configurations;

a second member, said second member being movable and having at least portions thereof being spaced from said first member;

a medium between said first member and said second member providing a coupling therebetween, the second member being movable to deform the first member, through the coupling provided by the medium, to a selected curvature; and

means attached to the first member such that the first member is prevented from assuming a concave curvature relative to the ambient.

4,128,311

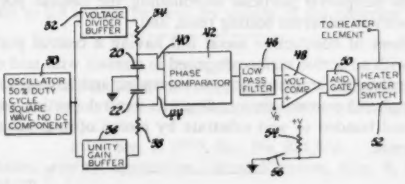
HEATER CONTROL METHOD FOR LIQUID CRYSTAL DEVICES

George W. Smith; Michael Kaplit, both of Birmingham, and Daniel B. Hayden, Port Huron, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1977, Ser. No. 820,640

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—331 **3 Claims**



1. The method of controlling a heater for a liquid crystal device containing a layer of liquid crystal material of the type having at a given operating temperature one dielectric constant when a weak electric field insufficient to alter the molecular orientation is applied thereacross and another dielectric constant when a strong electric field effective to alter the molecular orientation is applied, and below operating temperature having a dielectric constant substantially unchanging with changes in field strength; comprising the steps of

applying across the liquid crystal material layer the said weak electric field and sensing the dielectric constant to botain a first electrical signal having a parameter dependent on the dielectric constant,

applying across the liquid crystal material layer the said strong electric field and sensing the dielectric constant to obtain a second electrical signal having a parameter dependent on the dielectric constant,

comparing the first and second electrical signals to produce a control signal effective to turn on the heater for the liquid crystal device, if it is off, when the said parameters of the said signals are substantially equal indicating that the dielectric constant is nonresponsive to the difference in applied fields, and to produce a control signal effective to turn off the heater for the liquid crystal device, if it is on, when the said parameters of the said signals differ by a predetermined value indicating that the dielectric constant is changeable in response to the difference in applied fields.

4,128,312

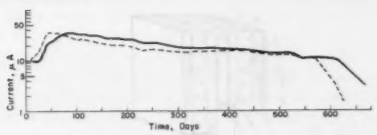
LONG LIFE REFLECTIVE LIQUID CRYSTAL DISPLAY FOR DC OPERATION

Hong S. Lim, Agoura, and Michael J. Little, Tarzana, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 4, 1977, Ser. No. 839,224

Int. Cl.[2] G02F *1/13;* **C09K** *3/34*

U.S. Cl. 350—336 **9 Claims**



1. A reflective mode dynamic scattering display device capable of sustained operation when subjected to a dc current excitation comprising an electrode consisting of a transparent substrate coated with a thin layer of transparent conductor film selected from the group consisting of indium oxide, tin oxide and indium-tin oxide which functions as an anode, and a rigid substrate containing a silver mirror surface which surface functions as a cathode, maintained in a predetermined spaced relationship to said anode by spacers, the intermediate space containing a phenylbenzoate ester liquid crystal mixture doped with a redox dopant formed from mixtures of metallocenes and conjugated cyano-organic compounds which functions as an active electro-optic element in response to a dc current excitation.

4,128,313

LIQUID CRYSTAL DISPLAY WITH DARK CHARACTERS ON LIGHT BACKGROUND

Herbert S. Cole, Jr., Scotia, and Charles R. Stein, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,659

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—340 **21 Claims**

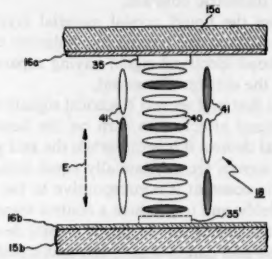
1. A method for fabricating a dichroic liquid crystal cell for a display having relatively dark indicia upon a relatively light background, comprising the steps of:

a. providing a pair of substantially transparent electrodes;

b. fabricating upon at least one of the electrodes a parallel-alignment film in each of at least one area defining the indicia;

c. treating the remainder of the surface area of each electrode to form a homeotropic-alignment boundary;

d. positioning the treated surfaces of the pair of electrodes in facing, spaced-apart relationship; and



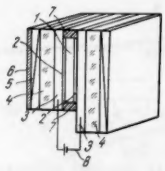
e. filling the volume between the spaced electrodes with a dichroic nematic liquid crytal material.

4,128,314

LIQUID-CRYSTAL INDICATOR

Vladimir P. Sevostiyanov, ulitsa B. Khmelnitskogo, 20/24, kv. 25; Valery V. Astakhov, ulitsa Borisova-Musatova, 8-a, kv. 5, and Vasily P. Usachev, ulitsa Ordzhonikidze, 11-a, kv. 5, all of Saratov, U.S.S.R.

Filed Jun. 10, 1977, Ser. No. 805,309
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—341 **3 Claims**



1. A liquid-crystal indicator comprising a layer of nematic liquid crystals; two transparent multi-layered blocks with said layer of said nematic liquid crystals being located thereinbetween; each of said multi-layered blocks containing successively disposed in a direction from said layer of said nematic crystals: a layer of germanium oxide ensuring orientation of molecules of said liquid crystals so that major axes of the molecules adjacent to one multilayered block are parallel thereto and to each other and form an angle of 90° with respect to major axes of the molecules adjacent to the second multilayered block; a current-conducting layer; a dielectric layer; a polarizing layer.

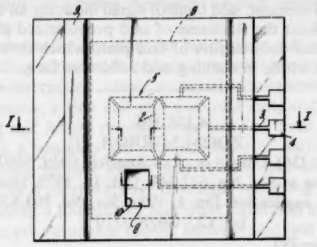
4,128,315

THIN ELECTROCHROMIC DISPLAY

Louis A. Zanoni, Trenton, N.J., assignor to Timex Corporation, Waterbury, Conn.

Filed Jun. 15, 1977, Ser. No. 806,892
Int. Cl.[2] G02F *1/00, 1/17, 1/23*
U.S. Cl. 350—357 **4 Claims**

1. A thin electrochromic display cell comprising:
- a transparent substrate having transparent electrodes thereon, said electrodes coated with electrochromic material,
- a cationic ion exchange resin electrolyte disposed in contact with said electrochromic material,
- a conductive foil member having a coating thereon disposed in contact with said electrolyte to facilitate cationic transport of cations in said electrolyte for actuating said electrochromic material, and
- an insulating tape member covering and adhered to said foil member and also adhered to said substrate around the outside of said foil member, said tape member having an aperture therein for permitting electrical contact to be



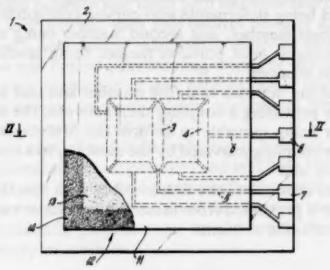
made with said foil member said tape member being impervious to moisture from said electrolyte and impervious to contaminates external to said cell.

4,128,316

THIN ELECTROCHROMIC DISPLAY

Louis A. Zanoni, Trenton, N.J., assignor to Timex Corporation, Waterbury, Conn.

Filed Jun. 15, 1977, Ser. No. 806,893
Int. Cl.[2] G02F *1/00, 1/17, 1/23*
U.S. Cl. 350—357 **6 Claims**



1. An electrochromic display device having a single substrate member, said device comprising:
- a transparent substrate having transparent electrodes with electrochromic material thereon,
- a fibrous spacer member impregnated in its central portion with an electrolyte disposed in contact with the electrochromic material on said electrodes, and impregnated in its peripheral portions surrounding the central portion with an adherent sealing resin, and
- a sheet of conductive metal foil having a central portion with an active surface disposed in contact with said electrolyte to facilitate cationic transport, and having its peripheral portion surrounding the central portion sealed and bonded to said substrate by means of said adherent resin.

4,128,317

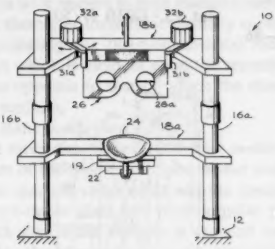
POSITIONING MEANS FOR OPHTHALMIC EXAMINATIONS

Maurice LeCover, 8700 Beverly Blvd., Room A310, Los Angeles, Calif. 90048

Filed Jun. 1, 1977, Ser. No. 802,451
Int. Cl.[2] A61B *3/00*
U.S. Cl. 351—38 **10 Claims**

1. Positioning means for use in conjunction with an ophthalmoscope of slit lamp stand, comprising:

(a) a lower ledge mounted on the stand;
(b) a support means for the chin, mounted bidirectionally movable adjacent the lower ledge.
(c) an upper ledge mounted on the stand;
(d) a face shield, mounted laterally slidable on the upper ledge, having spaced openings for the eyes;
(e) a guide stick essentially in the shape of an inverse "T" disposed adjacent the face shield vertically slidable in the



upper ledge, so as to cause the horizontal part of the guide stick to appear within the shield openings;
(f) two arms mounted circularly turnable and spacedly from one another on the upper ledge, so as to provide supporting means for the temples, said support means, face shield, guide stick and arms being operable in coordination with one another to position the face of the patient to obtain an immaculate image of his eyes by way of the ophthalmoscope or slit lamp.

4,128,318

SURFACE-TREATED SOFT CONTACT LENSES

Charles L. Sieglaff, Mentor; Charles J. Hora, Painesville, and Joseph P. Tiefenbach, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 674,448, Apr. 7, 1976. This application Mar. 22, 1978, Ser. No. 888,830
Int. Cl.[2] C08F *8/32*
U.S. Cl. 351—160 R **11 Claims**

1. A process for producing a soft contact lens resistant to the diffusion and accumulation therein of substances which will promote its clouding and discoloration in use which comprises treating an acrylic ester hydrogel with an aliphatic aminoalcohol containing 2–6 carbon atoms/molecule, said aminoalcohol containing at least one functional group reactive with the polar functional groups in said hydrogel, the treatment being conducted for a sufficient period of time to structurally modify at least a major portion of polymer molecules on the outer surfaces of the hydrogel by chemcally incorporating therein the modifying compound through its functional groups, the aminoalcohol being incorporated in an amount of 0.0001 to 0.5 weight percent, by weight of the polymer.

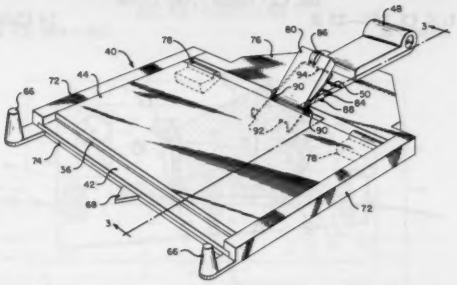
4,128,319

COVER PLATE FOR A MICROFORM READER

Ernest J. Clarke, London, England, assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 8, 1977, Ser. No. 831,566
Claims priority, application United Kingdom, Mar. 9, 1977, 09865/77
Int. Cl.[2] G03B *23/08, 1/48*
U.S. Cl. 353—27 R **6 Claims**

1. A viewing device comprising:
a carrier for holding a record member to be viewed;
an optical system;
means for indexing said carrier relative to said optical system for displaying a selected portion of a record member carried by said carrier in said optical system;
said carrier being moveable between first and second positions and having cover means thereon with means for pivotally mounting said cover means on said carrier for movement between open and closed positions;
a resilient means for interconnecting said cover means and said carrier to enable said resilient means to move said cover means to said open position when a predetermined amount of energy is added to said resilient means;
means for adding energy to said resilient means to progressively store energy therein as said carrier is moved towards said first position to enable said resilient means to move said cover means towards said open position as said carrier is moved towards said first position and



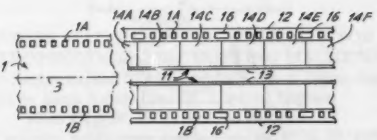
means for mounting said resilient means on said carrier, said resilient means having a first portion to engage said means for adding energy and a second portion to enage said cover means.

4,128,320

STEREOSCOPIC FILMS AND VIEWERS THEREFOR

Giuliano Cecchini, Via dell'Argin Grosso 105, Florence, Italy

Division of Ser. No. 611,877, Sep. 10, 1975. This application Jan. 21, 1977, Ser. No. 761,243
Int. Cl.[2] B26D *11/00*
U.S. Cl. 353—120 **8 Claims**



1. A method of producing a stereoscopic film from a length of film having sprocket holes along each longitudinal margin of the film comprising the steps of
longitudinally severing the film into two equal portions, and
enlarging selected ones of the sprocket holes to provide a series of regularly occurring locating holes, each locating hole enabling a corresponding pair of stereoscopic frames to be recorded side by side longitudinally of the film, said stereoscopic frames having their longest side along the length of said film, said locating holes being spaced apart a pitch equal to twice that of said longest side of said frames and thereafter enabling the stereoscopic frames to be correctly located in a viewer.

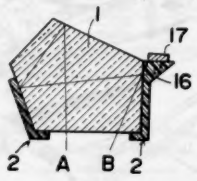
5. The film formed by the method of claim 1.

4,128,321

PENTAGONAL PRISM AND RELATED OPTICAL STRUCTURES FOR SINGLE LENS REFLEX CAMERAS

Toshio Kobori, Sakai, and Isamu Uchida, Kawachinagano, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1977, Ser. No. 763,680
Claims priority, application Japan, Jan. 22, 1976, 51-6412
Int. Cl.[2] G03B 7/08, 13/08
U.S. Cl. 354—23 R 14 Claims



1. In a single lens reflex camera having a pentagonal prism, an auxiliary optical system comprising:

at least one light reflecting optical element coacting with and disposed adjacent to said pentagonal prism; and

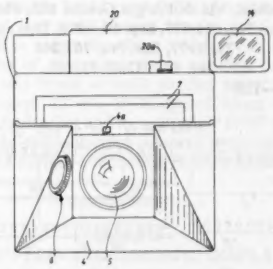
a holder made of a transparent plastic material and including as an integral part thereof said light reflecting optical element, said holder holding said pentagonal prism in the horizontal direction and in the vertical direction.

4,128,322

INSTANT-PICTURE CAMERA

Otto Stemme, Munich, and Peter Lermann, Narring, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Apr. 28, 1977, Ser. No. 791,986
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618989
Int. Cl.[2] G03B 17/50
U.S. Cl. 354—83 8 Claims



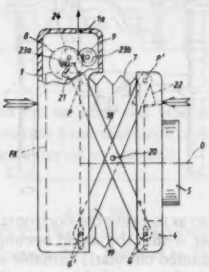
1. An instant-picture camera of the type using a film pack which comprises rectangular film sheets each of which is provided with a supply of developer in a compartment extending along one of the narrow edges of the sheet and arranged to be squeezed upon exposure of the sheet, said camera comprising a camera body having an upper end provided with a slot for discharging of exposed sheets, and a film chamber dimensioned to receive a film pack with said compartments located beneath and adjacent to said slot; a cover for said film chamber to permit insertion and removal of the film pack; a lens on said camera body and having an optical axis; a cap straddling said upper end of said camera body and being slidable therein in direction transverse to said optical axis; and a viewfinder mounted in said cap.

4,128,323

CAMERA WITH IMPROVED FILM-TRANSPORT ACTUATION

Richard Wick; Otto Stemme, both of Munich; Peter Lermann, Narring, and Günter Fauth, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 13, 1977, Ser. No. 796,722
Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622372
Int. Cl.[2] G03B 17/50
U.S. Cl. 354—86 7 Claims



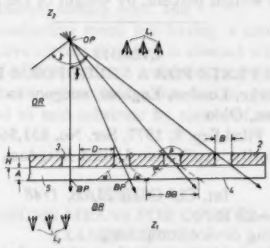
1. In a camera provided with a housing and with a lens having an optical axis, a combination comprising transporting means actuatable for transporting a film with reference to the housing; operating means, including a member carrying said lens, a scissor-type linkage mounting said member on said housing for movement relative thereto lengthwise of the optical axis and for actuating said transporting means during such movement of said linkage, comprising two bars which cross and are pivoted to each other, one of said bars having one end pivoted to said member and the other of said bars having one end pivoted to said housing; and a pair of gear segments, each connected to one of said ends and pivotable with the respective bar for actuating said transporting means and cocking a shutter of the camera, respectively.

4,128,324

THREE-DIMENSIONAL PHOTOGRAPHY USING INCOHERENT LIGHT

Alfred Seeger, Am Steinern Kreuz 45, 6100 Darmstadt, Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 748,501
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2556034
Int. Cl.[2] G03B 35/00
U.S. Cl. 354—112 16 Claims



1. A novel method of photographically recording and three-dimensionally reproducing an object so as to present to an observer of the reproduction a view of the object which changes in dependence upon the changing viewpoint of the

observer, the method being of the type wherein the three-dimensional recording medium employed comprises a photographic plate and an aperture-raster plate which is parallel to but spaced a predetermined distance away from the photographic plate, the aperture-raster plate being provided with a multitude of regularly distributed apertures, the method furthermore being of the type comprising the steps of illuminating the object to be recorded and registering the light rays emanating from the illuminated object on the three-dimensional recording medium with respect to both intensity and direction of such rays, and thereafter three-dimensionally reproducing the object by illuminating the three-dimensional recording medium with light which is incident upon the recording medium in the direction opposite to that in which the observer views the recording medium,

the improvement comprising

using for the three-dimensional recording medium a recording medium of the type defined above, but with the thickness of the aperture-raster plate and the spacing between the aperture-raster plate and photographic plate having values such that, if the medium is exposed to omnidirectional light, the elementary images projected onto the photographic plate by the individual apertures substantially abut and are neither appreciably spaced apart nor overlapping,

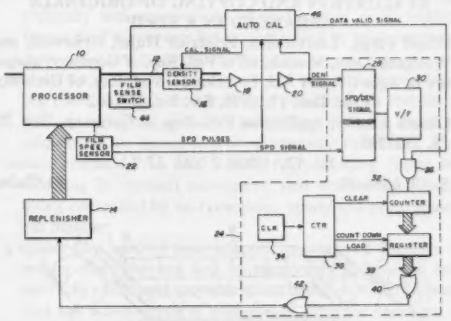
performing the recording of the light rays emanating from the illuminated object using omnidirectional light and without the use of a lens intermediate the object and the recording medium,

and performing the three-dimensional reproduction using omnidirectional light.

4,128,325
AUTOMATIC DENSITY MEASUREMENT CALIBRATION FOR PHOTOGRAPHIC REPLENISHMENT SYSTEM

Theodore A. Melander, and Ralph L. Charnley, both of Minneapolis, Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed May 31, 1977, Ser. No. 802,061
Int. Cl.[2] G03D *13/00*
U.S. Cl. 354—298 **16 Claims**



1. In a replenisher system for providing replenisher fluid to a processor of photosensitive material, the replenisher system including parameter sensing means for providing a parameter signal indicative of a measured parameter associated with the processing of the photosensitive material and including replenisher control means for controlling replenishment as a function of the parameter signal, the improvement comprising:

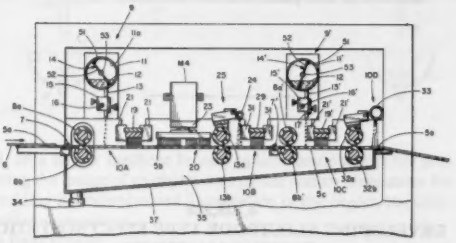
photosensitive material sensing means for sensing the presence of photosensitive material approaching the parameter sensing means; and

calibration means for calibrating the parameter sensing means in response to a signal from the photosensitive material sensing means prior to the photosensitive material reaching the parameter sensing means.

4,128,326
CHEMICAL DISPENSING SYSTEM

Martin M. Selak, Des Plaines, Ill., assignor to Astro Engineering Co., Skokie, Ill.

Filed Jun. 2, 1977, Ser. No. 802,812
Int. Cl.[2] G03D *3/04*
U.S. Cl. 354—317 **20 Claims**

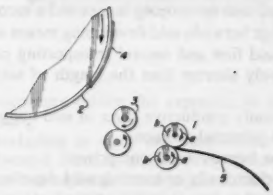


1. A printing plate processing apparatus comprising, in combination: conveyer means having an inlet station for receiving exposed offset printing plates having photosensitive coatings thereon and which have been selectively exposed and for delivering said exposed printing plates to a developing station, a supply container having a storage space therein positioned immediately above and extending substantially the full width of said developing station for holding a supply of chemical having a liquid carrier in which is distributed particles therein which can settle-out therefrom, stirring means for continuously stirring the chemical in said supply container to keep said particles in dispersion within said liquid carrier, means for directing said chemical from said supply container to the printing plates on said conveyor means comprising only laterally spaced conduit means at the bottom portion of said container and extending substantially only vertically so that there are no horizontal runs in said conduit means and said chemical is delivered from said storage space by force of gravity, control valve means associated with each of said conduit means for opening and closing said conduit means, and printing plate position sensing means responsive to a printing plate being fed to said developing station for operating each control valve means to a position which opens the associated conduit means.

4,128,327
TRANSFER MATERIAL FEED APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINES

Mitsuhiko Sugiyama, and Michio Shinkai, both of Ebina, Japan, assignors to Rank Xerox Limited, London, England

Filed Oct. 25, 1977, Ser. No. 844,851
Claims priority, application Japan, Oct. 26, 1976, 51/127876
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 R **5 Claims**



4. A method of synchronizing the position of a copy sub-

strate with an image on a photosensitive member, comprising the steps of:

(a) providing a photosensitive member rotating at a set velocity with a transferrable image thereon;

(b) feeding a copy substrate with a first feeding means at a slower velocity than said set velocity toward said photoreceptor;

(c) receiving said substrate by a second feeding means; and

(d) feeding said substrate with said second feeding means at a velocity equal to said set velocity of said photosensitive member to said photosensitive member.

4,128,328

DEVELOPING ELECTRODE TYPE ELECTROSTATIC COPYING MACHINES

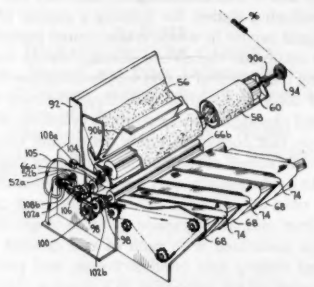
Toshio Matsui, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 25, 1976, Ser. No. 689,846

Claims priority, application Japan, May 28, 1975, 50-64536; Nov. 5, 1975, 50-133435

Int. Cl.[2] G03G *15/00*; B05B *5/02*

U.S. Cl. 355—3 DD **15 Claims**



1. In an electrostatic copying machine using a copy sheet having a dielectric layer or photoconductive layer formed on an electrically-conductive layer, means for forming an electrostatic latent image on said copy sheet, developing electrode means including a developing electrode and opposing electrode mounted in spaced relationship enabling passage of said copy sheet therebetween for developing said electrostatic latent image on said copy sheet into a toner image, means for fixing said toner image on said copy sheet, transporting means for conveying said copy sheet and positioned between said developing means and said fixing means,

a first transporting passage between said image forming means and said developing means and a second transporting passage between said developing means and said fixing means, said first and second transporting passages being respectively shorter than the length of said copy sheet; and

said electrically conductive layer of said copy sheet having a charge potential thereon;

wherein the improvement comprises:

means for electrically connecting said developing electrode and said opposing electrode directly to each other and means for separately electrically insulating said developing electrode and said opposing electrode from grounding means including the body proper of said copying machine.

4,128,329

APPARATUS FOR PRODUCING BIAS VOLTAGE FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINES

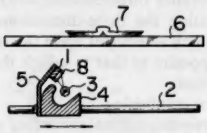
Haruyoshi Kawano, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 27, 1976, Ser. No. 727,129

Claims priority, application Japan, Oct. 3, 1975, 50-119476

Int. Cl.[2] G03G *15/06*

U.S. Cl. 355—14 **4 Claims**



1. An electrophotographic copying apparatus of the type comprising:

a photosensitive member having a surface on which electrostatic latent images of originals are formed;

a scanning-type exposure optical system comprising a light source means, relatively movable with respect to said originals, for producing electrostatic latent images of said originals on said surface;

developer means for developing electrostatic latent images on said surface; and

developing electrode means for creating a bias voltage adjacent said surface during development; wherein the improvement comprises:

transducer means, disposed at a fixed distance from and in the uninterrupted direct light from said light source means during the relative movement between said light source means and said originals, for converting the amount of light from said light source means into an electrical quantity;

amplifier means for amplifying the electrical quantity; and

means for applying the output of the amplifier means as a source of bias voltage to said developing electrode means.

4,128,330

EVALUATION AND COPYING OF ORIGINALS ARRANGED IN A STRIP

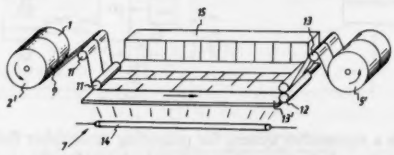
Berthold Fergg, Taufkirchen; Friedrich Hujer, Grünwald, and Wolfgang Zahn, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Dec. 17, 1976, Ser. No. 751,602

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557755

Int. Cl.[2] G03B *27/32, 27/52*

U.S. Cl. 355—32 **11 Claims**



1. In a method of processing a strip of originals to be copied, in combination, the steps of transporting the strip of originals prior to copying thereof through an evaluation station at which the originals are displayed for visual evaluation by a human operator, at the evaluation station visually evaluating the originals with respect to density, color, copiability, or the like, attaching to the strip of originals a discrete strip-shaped information carrier running along the length of the strip of originals and effecting the attachment latest during the evaluation at the evaluation station, and at the evaluation station

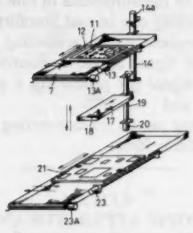
entering information derived from the human operator's visual evaluations upon the information carrier alongside the associated ones of the originals.

4,128,331

PROCESS PRINTING APPARATUS

Saburo Nakamura, 21, Tsutsui-cho 1-chome, Higashi-ku, Nagoya-shi, Aichi-ken, Japan

Filed Jul. 27, 1977, Ser. No. 819,247
Int. Cl.[2] G03B *27/32, 27/42, 27/58*
U.S. Cl. 355—32 **6 Claims**



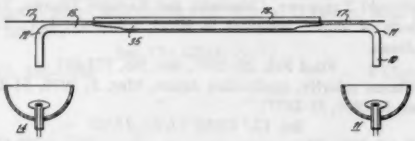
1. An apparatus for making reproductions or negatives for use in plate making, comprising:
- a base frame;
- a vertical supporting post secured at its lower end to said base frame;
- a master copy holding frame spaced above said base frame and vertically movable supported on said supporting post;
- a computor means for controlling the vertical position of said copy holding frame in a programmable manner;
- a light source carried on said master copy holding frame;
- a lens system depending from the underside of said master copy holding frame;
- a copy paper holding plate carried on said base frame;
- a movable plate carried by said master copy holding frame, said plate being movable in a horizontal plane both longitudinally and transversely of said master copy holding frame, said movement being controlled by said computor means in a programmable manner;
- said light source, said lens system and said copy paper holding plate being aligned with one another with respect to the axis of light emitted by said light source by means of said computor means in a programmable manner;
- means connected to said master copy holding frame for effecting its vertical movement, said vertical movement being controlled by said computor means in a programmable manner;
- a master film holding plate adapted to support a plurality of master films thereon and be removably secured to said movable plate, said movable plate being movable to position any selected one of said master films for exposure to said light, said movement being controlled by said computor means in a programmable manner;
- a masking cover provided in said master copy holding frame for selective exposure of said master films to said light, said selection of exposure being controlled by said computor means in a programmable manner;
- a focusing plate carried on said copy paper holding plate movably in a horizontal plane both longitudinally and transversely of said copy paper holding plate, said movement being controlled by said computor means in a programmable manner; and
- a plurality of horizontally movable overlays provided above said focusing plate.

4,128,332

ILLUMINATOR

Stephen H. Rowe, Harpenden, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 9, 1976, Ser. No. 656,559
Claims priority, application United Kingdom, Mar. 24, 1975, 12173/75
Int. Cl.[2] G03B *27/54*
U.S. Cl. 355—67 **2 Claims**



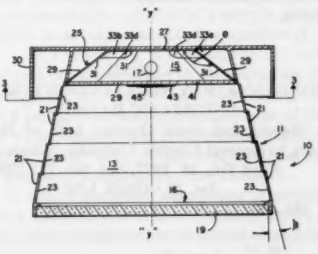
1. In a copier machine having optical components for projecting the image of an object on a platen and an illuminator for providing a predeter[illegible]ined illumination of the object, the combination comprising
- a light source;
- a light conducting rod having a first portion with an end disposed adjacent the light source and effective to transmit light from the source along the rod by means of multiple internal reflections therealong and a second portion curved with respect to the first portion and disposed in relation to the platen for illumination of an object supported thereon;
- a surface layer of transparent material supported on the second portion of the rod to effect transmission of light from the inside to the outside of the rod and being contoured to control the intensity of illumination along the second portion of the rod onto the object, the surface layer of transparent material having a refractive index greater than the refractive index of the light conducting rod.

4,128,333

LIGHT EXPOSURE DEVICE INCLUDING LIGHT DIFFUSING AND ABSORBING REGIONS THEREIN

Robert E. Levin, S. Hamilton, and George J. English, Reading, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jul. 5, 1977, Ser. No. 812,833
Int. Cl.[2] G03B *27/54*
U.S. Cl. 355—67 **17 Claims**



1. A light exposure device for exposing an original, said device comprising:
- a housing including an open end adapted for having said original located thereat, said housing defining therein a light-absorbing region located adjacent said open end of said housing and a light-diffusing region located immediately adjacent said light-absorbing region; and
- a light source positioned within said light-diffusing region of said housing, said light-diffusing region of said housing

directing the light from said light source toward said light-absorbing region and said open end of said housing whereby a portion of said light from said light source will pass through said open end in a substantially uniform manner and strike said original, said light-absorbing region located between said light source and said original.

4,128,334

ANCHORAGE FOR A MOVING BODY

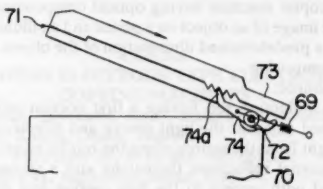
Nobuyuki Yanagawa, Chigasaki, and Kazuaki Tagawa, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 28, 1977, Ser. No. 772,682

Claims priority, application Japan, Mar. 5, 1976, 51-23776; Mar. 5, 1976, 51-23777

Int. Cl.[2] G03B *27/62, 15/00*

U.S. Cl. 355—75 **10 Claims**



7. In a copying machine of the type including:

a main body portion;

an original receptacle supporting means mounted on said main body portion for pivoting between a closed level position and an open position inclined with respect to said main body portion; and

original scanning means mounted on said supporting means for reciprocating movement thereon; the improvement comprising means for holding said scanning means against movement by its own weight on said supporting means when said supporting means is in the open inclined position comprising:

first means operatively connected to said scanning means for movement in conjunction with the reciprocating movement thereof; and

second means for automatically locking said first means against said conjunctive movement in response to the pivoting of said supporting means to the open position whereby said scanning means is held against movement by its own weight on said supporting means while in the open position.

4,128,335

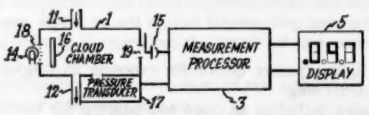
CONDENSATION NUCLEI COUNTER WITH AUTOMATIC RANGING

John B. Haberl, and Janis Ozolins, both of Dalton, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,230

Int. Cl.[2] G01N *1/00*

U.S. Cl. 356—37 **12 Claims**



6. A condensation nuclei counter for measurement of concentrations of Aitken particles in gases comprises:

(a) a cloud chamber having means for repetitively charging and purging the chamber with humidified gas samples, means for adiabatically expanding said samples while the chamber, dark field illumination means, photosensitive means for observing and for generating a photoelectric signal proportional to light scattered by liquid droplets condensing on Aitken particles in said chamber and coordinating means for producing a zero time signal indicating the time of occurrence of the adiabatic expansion which starts droplet formation;

(b) quantitating means including clock means responsive to said zero time signal for producing a plurality of time signals for measuring time of droplet growth, amplifier means responsive to said photoelectric signal for producing amplifications of said photoelectric signal representing the extent of droplet growth, sampling means responsive to said amplifications and to said time signals for producing a plurality of measurements of rate of droplet growth, means for selecting one of said plurality of measurements as the measurement signal according to an established criteria, output signal means responsive to said selected measurement signal for producing a quantitating means output signal; and

(c) data processing means for converting said output signal to human readable form.

4,128,336

SPECTROSCOPIC APPARATUS AND METHOD

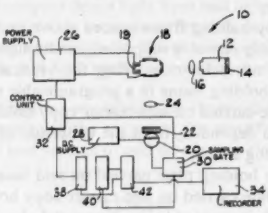
Louis R. P. Butler, Pretoria, South Africa, assignor to The South African Inventions Development Corporation, South Africa

Filed Aug. 16, 1976, Ser. No. 714,313

Claims priority, application South Africa, Aug. 21, 1975, 75/5358; Aug. 21, 1975, 75/5359

Int. Cl.[2] G01J *3/30*

U.S. Cl. 356—307 **15 Claims**



1. An apparatus for spectroscopically determining the presence of a particular element in a substance of unknown composition comprising

generating means for generating by cathodic sputtering an atomic cloud of the particular element,

means for controlling said generating means to cease atomic cloud generation to allow the inherent radiation emitted by the cloud to decay to substantially zero,

means for irradiating the atomic cloud with radiation emitted from a substance that is characteristic of its component elements such that selected components of the radiation are absorbed by the atoms of the atomic cloud and the atoms of the atomic cloud re-radiate characteristic radiation,

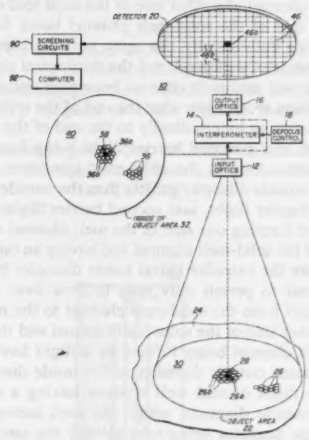
means for detecting the amount of re-radiated characteristic radiation emitted by the atomic cloud,

enabling means enabling the detection means for a first predetermined period of time after the generating means has ceased generating the cloud and the atomic cloud no longer emits inherent radiation to allow detecting of the amount of re-radiated radiation when the inherent radiation of the atomic cloud has decayed, said enabling means enabling said detection means for a further predetermined later time period when the concentration of the atomic cloud has decayed to substantially zero, and a processing means for subtracting the output of the detection means during the later time period from the output for the first time period.

4,128,337
METHOD OF AND APPARATUS FOR INTERFEROMETRIC BACKGROUND SUPPRESSION

Theodore F. Zehnpfennig, Wayland, Mass., assignor to Visidyne, Inc., Burlington, Mass.

Filed Jun. 13, 1977, Ser. No. 806,199
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—346 2 Claims

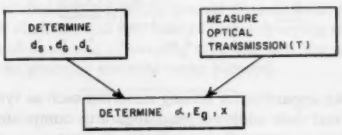


1. A method of detecting a small elemental spectral source in a larger spectral background by interferometric suppression of the background comprising: producing first and second complementary interferograms of each element of that object area; projecting onto a detector images of said first and second interferograms; and, defocussing one of said first and second interferograms for providing a fluctuating elemental interferogram output from each element of said detector which receives an interferogram derived from an element of said object area that contains a source which spectrally distinguishes from the background, while reducing the output corresponding to each element containing no source to a constant and non-fluctuating level.

4,128,338
MODIFIED OPTICAL TRANSMISSION TECHNIQUE FOR CHARACTERIZING EPITAXIAL LAYERS

Theodore T. S. Wong, Maynard, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 17, 1977, Ser. No. 807,608
Int. Cl.[2] G01N 21/22
U.S. Cl. 356—432 3 Claims



1. A method of determining the energy bandgap of an epitaxial semiconductor layer on a substrate, wherein a graded bandgap region exists between the epitaxial semiconductor layer and the substrate, the method comprising:

determining the thickness d_S of the substrate, the thickness d_G of the graded bandgap region, and the thickness d_L of the epitaxial semiconductor layer;

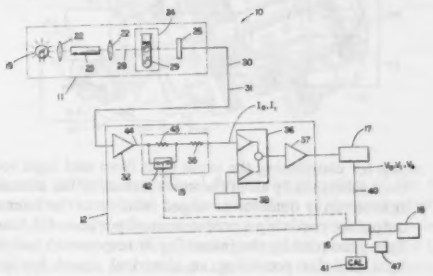
measuring optical transmittance of the layer, graded bandgap region and substrate as a function of wavelength; and

determining the energy gap of the layer from the values of d_S, d_G, and d_L and the results of the measuring of optical transmittance.

4,128,339
AUTOMATICALLY-ADJUSTING PHOTOMETER

Yasuhiro Yamazaki, Laguna Niguel; Robert H. Johnson, El Toro, and Mark D. McNeil, Irvine, all of Calif., assignors to Bio-Dynamics Inc., Indianapolis, Ind.

Filed Jan. 6, 1977, Ser. No. 757,352
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638333
Int. Cl.[2] G01N 21/22
U.S. Cl. 356—434 8 Claims



1. An automatically-adjusting photometer for measuring light absorption of a sample which comprises:

an optical portion having in combination a light source providing a beam of light, a sample test location, and a photodetector, said light source being constructed to transmit the beam of light through the sample test location so as to strike the photodetector, said photodetector being constructed to transmit an electrical output signal proportional to the intensity of the beam of light;

converting network means for receiving at an input the electrical output signal and converting said output signal to a logarithmic value;

said converting network means including means for selectively reducing said output signal by a predetermined factor prior to conversion to a logarithmic value;

a computer having control and computational modes and a memory portion, said computer in the control mode being constructed to sequentially perform measurment of the logarithmic values of output signals placing these in memory, said computer in the computational mode being constructed to retrieve data stored in memory and calculate the actual absorbance value A of a sample placed in the test location in accordance with the equation $A = (V_s - V_o)/(V_1 - V_o)$ where V_o is the logarithmic value of th output signal occurring when the transmission degree of light through the test location is a known reference value between 0 and 1, V_1 is the logarithmic value of the output signal of V_o reduced by said predetermined factor, and V_s is the logarithmic value of the output signal occurring when a sample is placed in the test location;

an analog to digital converter connecting an output of said converting network means to a computer input; and

a display apparatus connected to an output of said computer.

4,128,340
PORTABLE TEST APPARATUS FOR LOW LIGHT LEVEL DEVICES

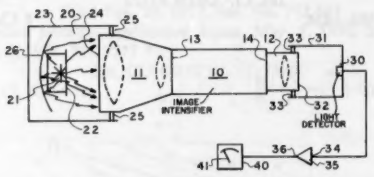
Ferdinand G. Fender, Glenview, and Jon E. Tegethoff, Schaumburg, both of Ill., assignors to Ni-Tec, Inc., Skokie, Ill.

Filed Jul. 23, 1976, Ser. No. 708,014
Int. Cl.[2] G01J 1/42; G01D 18/00
U.S. Cl. 356—218 6 Claims

1. An apparatus for measuring the light intensity gain performance of an image intensifier of the type having an input

surface for receiving input visible light and an output for providing output visible light which is an intensified image of said input visible light, said apparatus comprising:

a light source for illuminating the intensifier input surface with input light of predetermined and constant intensity, and light source comprising a light-tight enclosure having an opening dimensioned to receive said intensifier input and a seal about said opening to seal the gap between said opening and the intensifier input to ambient light to thereby assure that said input light is derived only from said light source,



means for distributing the input light from said light source over substantially all of the input surface of the intensifier;

a light sensitive detector arranged relative to the intensifier output for receiving a predetermined portion of the output light produced by the intensifier in response to said input light and for providing an electrical signal having an amplitude directly related to the intensity of said output light; and

an indicator coupled to said detector for providing an indication of the intensifier light intensity gain performance responsive to said electrical signal provided by said detector.

4,128,341

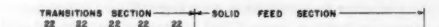
EXTRUDER SCREW

John S. Hsu, Nashua, N.H., assignor to Ingersoll-Rand Co., Woodcliff Lake, N.J.

Filed Apr. 29, 1977, Ser. No. 792,469

Int. Cl.[2] B01F *7/08;* B29B *1/10*

U.S. Cl. 366—89 **3 Claims**



1. An extruder screw for use in a plastic extruder having a solid plastic feed hopper and a heated barrel; said extruder screw having a solid feed section followed by a solid-melt transition section followed by a melt metering section and having at least three spiral channels formed on its outer circumference, one of said spiral channels being a solid feed channel located to receive solid plastic from the feed hopper and longitudinally convey the solid plastic particles as the particles start to melt, said solid feed channel extending along the length of the extruder screw and ending within the solid-melt transition section the flight of said solid feed channel being a substantially constant outside diameter within the solid feed section, said outside diameter being substantially the same as the inside diameter of the heated extruder barrel the extruder screw fits so that substantially no solid plastic particles or melt flows over said flight; another of said spiral channels being a solid-melt channel, said solid-melt channel extending longitudinally from the beginning to the end of said solid-melt transition section, a barrier flight being formed on said extruder screw within said solid-melt transition section and having an outside diameter less than the inside diameter of the heated extruder barrel the extruder screw fits, said barrier flight being common to and forming one side of the solid feed channel and forming one side of the solid-melt channel and having an outside diameter sufficiently less than the extruder barrel inside diameter to permit a mixture of solid plastic particles and melt to flow from the solid feed channel to the solid-melt channel, the other side of the solid feed channel and the other side of the solid-melt channel being formed by a flight having substantially the same outside diameter as the inside diameter of the barrel; and the third spiral channel being a melt channel, said melt channel beginning within the solid-melt transition section just after the end of the solid feed channel and extending longitudinally to the end of the melt metering section; and a second barrier flight being formed on said extruder screw within the solid-melt transition section and having an outside diameter greater than the outside diameter of the other barrier flight, said second barrier flight being common to and forming one side of the melt channel and forming one side of the solid-melt channel and having an outside diameter less than the extruder barrel inside diameter but yet sufficiently great to permit only melt to flow over said second barrier flight from the solid-melt channel to the melt channel and the other side of the solid-melt channel and the other side of the melt channel being formed by a flight having substantially the same outside diameter as the inside diameter of the barrel the flight of said melt channel having a substantially constant outside diameter within the melt metering section, said outside diameter being substantially the same as the extruder barrel inside diameter so that substantially no melt flows over said flight.

4,128,342

MIXING APPARATUS

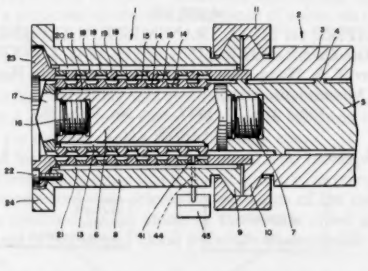
Paul Renk, Troisdorf, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Oct. 8, 1975, Ser. No. 620,783

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1974, 7433808[U]

Int. Cl.[2] B29B *1/06, 1/10*

U.S. Cl. 366—99 **6 Claims**



1. An apparatus for mixing materials such as synthetic polymers and their additives, said apparatus comprising:

a casing surrounding a cylindrical rotor,

a series of profile rings consisting of groove rings and spacer rings axially arranged in alternating sequence on said rotor and is said casing which are in snug axial engagement with one another,

said groove rings having grooves formed in their peripheral working surfaces which are circumferentially separated by shearing lands and which are limited in an axial direction by the end surfaces of said spacer rings abutting upon the end surfaces of said groove rings, said shearing lands and end surfaces defining said grooves as a series of individual closed chambers, and

said grooves formed on said rotor groove rings being arranged in a partially overlapping, axially displaced relationship with respect to the radially opposed grooves formed on said casing groove rings so that the material will flow between said overlapping rotor and casing closed groove chambers thereby causing repeated dispersal of the material as it moves through the mixing apparatus.

4,128,343

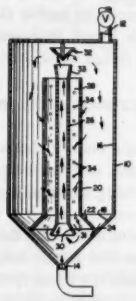
APPARATUS FOR BLENDING GRANULAR MATERIALS

Isaac Moked, New Brunswick; Kenneth C. Yi, Belle Mead; John O. McDonald, Englishtown, and Jannan G. Lee, Piscataway, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 645,361, Dec. 30, 1975, abandoned. This application Dec. 5, 1977, Ser. No. 857,815

Int. Cl.[2] B01F *13/02*

U.S. Cl. 366—101 **10 Claims**



1. Apparatus for blending free-flowing granular materials comprising: an outer chamber having walls which converge toward and terminate in outlet means at the base thereof; substantially vertically-positioned fenestrated blending tube means spaced above said outlet means having a plurality of entrance means therein; solid, conveying tube means extending substantially vertically through and coaxial within said blending tube means and defining an annular space therebetween; an entrainment zone positioned between said base of said conveying tube means and the base portion of said chamber; and gas inlet means positioned in said chamber to discharge gas upwardly into and through said entrainment zone toward the base inlet of said conveying tube means; the distance of the point of gas inlet discharge into said entrainment zone from said base of said chamber is defined by the equation:

$$X \leqq L - r \operatorname{Tan} \alpha,$$

wherein X is the distance between the base of said chamber and said point of discharge, L is the overall distance between said base of said chamber and said base of said conveying tube, r is the outer radius of said conveying tube and α is the angle of repose of the granular material being blended.

4,128,344

CENTRIFUGAL MIXER

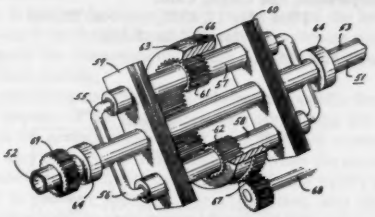
David H. Blasetti, 7019 Guilford Rd., Upper Darby, Pa. 19082

Continuation-in-part of Ser. No. 667,450, Mar. 16, 1976, Pat. No. 4,061,019. This application Oct. 25, 1977, Ser. No. 844,740

Int. Cl.[2] B01F *9/02*

U.S. Cl. 366—348 **8 Claims**

1. Apparatus for generating cyclically-reversing forces in a body of liquid comprising an elongated tubular chamber for carrying the liquid, means to revolve the chamber in a circular path about a first axis at a given angular speed, whereby a primary centrifugal force radial to said first axis is generated by each part of the liquid, a central hollow shaft coaxial with said first axis, support bearing means rotatably supporting said shaft, said revolving means operable to rotate said shaft, means mounting said chamber on said shaft for rotation about a second axis perpendicular to the direction of the primary centrifugal force whereby upon rotation of said hollow shaft said chamber moves in said circular path, drive means for effecting said rotation of said chamber on said second axis at an angular speed to produce a secondary centrifugal force in said part less



than said primary centrifugal force, the direction of the net force being determined by the orientation of the part relative to said secondary axis, to thereby cyclically reverse the orientation of the net centrifugal force generated by each part in the body, relative to said second axis, a branch conduit communicating with said hollow shaft at one end and connected to said chamber at its other end, said chamber having an imperforate circumferential wall retaining said liquid in said carrier against said centrifugal forces.

4,128,345

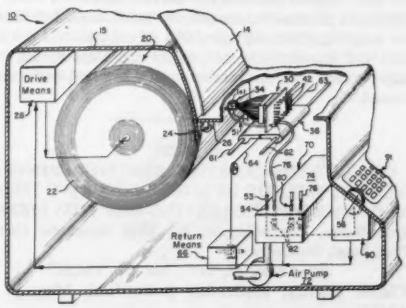
FLUID IMPULSE MATRIX PRINTER

John F. Brady, Clifton, N.J., assignor to Universal Technology, Inc., Clifton, N.J.

Continuation-in-part of Ser. No. 563,058, Mar. 28, 1975, abandoned. This application Mar. 11, 1976, Ser. No. 665,794

Int. Cl.[2] B41J *3/04, 3/20*

U.S. Cl. 400—120 **25 Claims**



1. A printer comprising:

means for printing information on a recording medium using a dot matrix comprising an array of closely-spaced tubes open at one end,

means adjacent said open end of said tubes for heating a fluid carried within the tubes of said array enough that the heat of the fluid upon emerging from said open end of said tubes produces detectable indicia on said recording medium,

a plurality of conduits connecting said tubes in said printing means to a stationary housing,

valves mounted in said stationary housing for selectively controlling the flow of fluid through said conduits and out the open end of said tubes, and

means for operating said valves in accordance with input information to control the flow of fluid through said conduits, whereby detectable indicia are produced on said recording medium that record said input information.

4,128,346

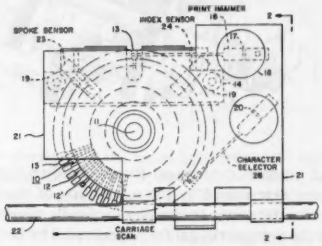
DAISY TYPE PRINT WHEEL APPARATUS

Evan L. Ragland, III, Atherton, Calif., assignor to Periphonics Corporation, San Carlos, Calif.

Filed May 11, 1977, Ser. No. 795,799

Int. Cl.[2] B41J *1/30*

U.S. Cl. 400—144.2 **15 Claims**



1. Printing apparatus comprising: a daisy type print wheel including a plurality of print elements carried on spokes radiating out from the wheel axis such print elements being oriented to lie in a plane perpendicular to said axis and including a fixed portion of magnetic material; means for rotating said wheel around its axis including drive shaft means; print hammer means adapted to impact a selected print element while such element is stopped; magnet means producing a magnetic field mounted for rotation with said drive shaft means and said wheel; brake means separate from said print hammer means and having only a single movable component which interfaces with said print wheel, for acting on said wheel for stopping its rotation and selecting one of said print elements for positioning such element to be hit by said hammer means; magnetic material means connected to said drive shaft means and juxtaposed with said magnet means and rotatable with said fixed wheel portion in a physical relationship to provide a substantial magnetic coupling force between said wheel and said drive shaft means and for allowing said wheel and shaft means to have relative rotary motion therebetween when said brake means is actuated.

4,128,347

CHARACTERS-CARRYING DISC FOR PRINTING MACHINE, METHOD OF MANUFACTURING THIS DISC AND MOULD FOR CARRYING OUT THIS METHOD

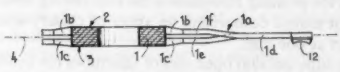
Alfred Bauer, Rue Maujobia 95, 2000 Neuchatel Canton of Neuchatel, Switzerland

Filed May 13, 1977, Ser. No. 796,517

Claims priority, application Switzerland, May 24, 1976, 6514/76

Int. Cl.[2] B41J *1/32*

U.S. Cl. 400—144.2 **4 Claims**



1. A unitary character-bearing disc for use with a printing machine, the disc comprising:

a central hub portion having opposite faces;

at least first and second sets of radially extending flexible and resilient radial arms formed integrally with the central hub portion about the outer periphery thereof, each arm having a root at the inner end thereof integrally formed with said hub portion, each arm further having a terminal end at the end thereof opposite said root, said hub portion being thicker than the combined thickness of one each of said flexible arms from each of the sets taken at the roots of said arms, the roots of one set of arms lying in a different plane than the roots of the other set of arms so that the roots of alternate arms extending from the central hub portion lie in different planes, the terminal ends of all arms of all sets lying in the same plane, the plane of one set of roots being located near one face of said hub portion and the plane of the other set of roots being located near the opposite face of said hub portion, the root of each arm being thicker in a direction substantially parallel to the longitudinal axis of the hub portion than is the terminal end of said arm, the root of each arm further being more narrow in a plane substantially perpendicular to the longitudinal axis of the hub portion than is the terminal end of said arm, the alternatingly out-of-plane roots being thereby integrally formed with the central hub portion yet being positioned thereon to enable the arms to be freely moveable along their length independently of the others and capable of being flexed without friction therebetween; and,

means for defining characters at the terminal ends of said arms.

2. A mould for forming a unitary character-bearing disc for use with a printing machine, said disc being of the type having a hub and a plurality of integral radially outwardly extending flexible resilient arms arranged in a pair of sets with each of the arms having a root and a terminal end, the roots being thicker in planes substantially parallel to the longitudinal axis of the hub than the terminal ends, the roots further being more narrow in a plane substantially perpendicular to the longitudinal axis of the hub than the terminal ends, one of said sets having the roots of the individual arms thereof lying in one plane and the other of said sets having the roots of the individual arms thereof lying in a second different plane, the radial arms of one set alternating with the radial arms of the other set, the terminal ends of all arms lying in a common plane, said mould comprising a pair of matable mould elements having a common center point, a first set of radial grooves formed in one of said mould elements disposed about said central point and a second set of radial grooves formed in said one mould element also disposed about said central point, said second set of grooves having a greater depth and a more narrow width than the first set of grooves and said second set of grooves being an inwardly directed extension of alternate ones of said first set of grooves, a third set of radial grooves and a set of radial ribs formed in said other of said mould elements, said third set of grooves having a greater depth and a more narrow width than the first set of grooves, each of the ribs alternating with each one of said third set of radial grooves, the length and location of said ribs and third radial grooves relative to the center point of said other mould element corresponding substantially to the length and location of the respective ones of said second set of grooves formed in said one mould element, said pair of mould elements being matable with their center points coincident and with the set of radial ribs engaged in the respective ones of the grooves of the second set of grooves and the third set of grooves disposed coincident with the portions of the first element adjacent those grooves of the first set of grooves which are not extended by the respective grooves of the second set of grooves, whereby the terminal ends of the flexible and resilient arms of the disc are formed in the first set of grooves while the roots of one of said sets of arms are formed in the second set of grooves and the other of said sets of arms are formed in the third set of grooves.

4,128,348
METHOD AND APPARATUS FOR APPLYING INK TO RIBBONS

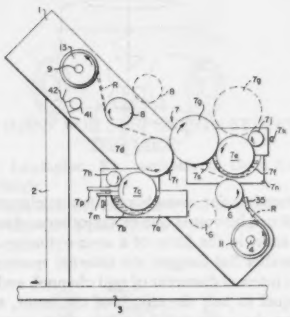
Bazil E. Steele, Rockville, and Paul O. Micheel, Ellicott City, both of Md., assignors to Steele Associates, Inc., Rockville, Md.

Filed Jul. 12, 1976, Ser. No. 704,320

Claims priority, application United Kingdom, Jul. 14, 1975, 29469/75

Int. Cl.[2] B41F *31/14*

U.S. Cl. 400—198 **20 Claims**



1. A method of applying ink to a ribbon comprising the steps of:

(a) supplying said ribbon to be inked from a supply core;

(b) heating said ribbon on a first rotating heated roller;

(c) passing the heated ribbon between the nip of a pair of inking rollers while applying ink to said ribbon under pressure exerted on both sides of said ribbon by said inking rollers with at least one of said inking rollers being driven to advance said ribbon;

(d) heating the inked ribbon on a second rotating heated roller; and

(e) collecting said inked ribbon on a driven take-up core.

4,128,349
FOUNTAIN BRUSH

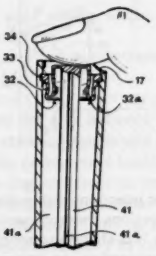
Luigi Del Bon, 141, Feldstrasse, Aarburg, Switzerland (CH-4663)

Continuation-in-part of Ser. No. 717,359, Aug. 24, 1976, Pat. No. 4,088,412. This application Jan. 31, 1977, Ser. No. 764,014

Claims priority, application Switzerland, Dec. 4, 1976, 15249/76; Jul. 19, 1976, 9311/76

Int. Cl.[2] A46B *11/08*

U.S. Cl. 401—151 **22 Claims**



1. A fountain brush having:

(a) a bristle carrier and, at one end of the latter, a set of bristles thereon;

(b) a handle attached to the other end of the bristle carrier and having a reservoir for a liquid or pasty medium in its interior, the end of said handle away from said bristles being open;

(c) a channel extending axially through the bristle carrier from the reservoir into the end of said carrier bearing the bristles and having at least one radial outlet orifice in the sidewall of said carrier, and ending blind in the bristles-bearing carrier end at a distance from said orifice;

(d) a slide valve member guided sealingly in the interior of said channel;

(e) an actuating device, attached to the end of the handle, remote from the bristles and comprising a closure member adapted for hermetically closing said reservoir having medium therein;

(f) a connecting rod, extending substantially axially through the interior of the reservoir, which connecting rod connects the actuating device and the slide valve member to one another and is of such length that when the actuating device is actuated, said connecting rod being rigidly resistant to pressure thereon in axial direction, said closing member being at such distance from said slide valve member that, in a filling position in which medium can be filled into said reservoir, said closing member leaves the open end of said handle free while said slide valve member seals off said reservoir in a position in said channel more remote from the blind end of the channel than said orifice;

(g) an elastically deformable bellows being connected hermetically sealingly with said closing member and the inner wall of said handle, in actuated as well as in unactuated position of said actuating device, thereby closing said reservoir, whereby said slide valve member obturates said orifice when in the said unactuated position and whereby, upon actuation by pressure on said closing-member, said slide valve member is moved into said blind end of said channel past said orifice clearing the latter; and

(h) said bellows is integral with said closing member and has an outwardly crimped annular fold, the apex of which is turned toward the interior of the reservoir, the outer wall of said fold being sealingly fastened, along its periphery, to the inner wall of said handle.

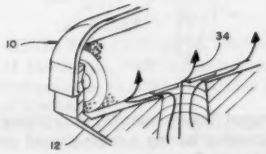
4,128,350
APPLICATOR ATTACHMENT

Robert J. Gamache, 33185 W. Warren, Westland, Mich. 48135

Filed Jan. 23, 1975, Ser. No. 543,428

Int. Cl.[2] B05C *17/00*; B43M *11/02*; B44D *3/28*

U.S. Cl. 401—208 **9 Claims**

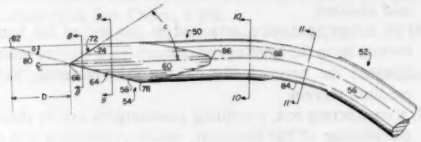


1. An applicator for dispensing cosmetics such as suntan lotion and the like comprising a body member, an elongated slot in one side of the body member having a width and a length, and resilient roller means rotatably mounted on the body member in the slot and extending radially from the slot having a diameter and length at the width and length of the slot slightly larger than the width and length respectively of the slot whereby the roller means is under compression across the width and length of the slot, and means for directing the cosmetic through the body member onto the roller over the greater portion of the surface thereof with the applicator inverted to place the roller lower than the cosmetic container on rotating the roller in frictional engagement with a body portion.

4,128,351
STERNOTOMY SURGICAL NEEDLE

Leonard D. Kurtz, Woodmere, and Philip Ludwig, Merrick, both of N.Y., assignors to Deknatel Inc., Queens Village, N.Y.

Filed Apr. 15, 1977, Ser. No. 787,984
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—305 8 Claims

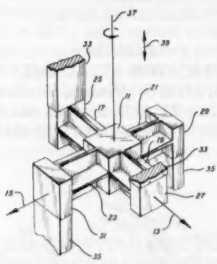


1. A surgical instrument comprising a body portion and a cutting portion, a pair of intersecting first and second planar surfaces forming a single main cutting edge extending from one side of the cutting portion of the instrument to a point at the end of the instrument, a third planar surface having an acute angle of convergence with the longitudinal axis of the instrument and extending from the opposite side of the cutting portion of the instrument to the point thereof, secondary cutting edges formed by the intersection of the third planar surface with said pair of first and second planar surfaces, the point at the end of the instrument being on the single main cutting edge so that the end portions of both the main and secondary cutting edges extend to the end point of the instrument.

4,128,352
TWO AXIS FLEXURE

William H. Newell, Mount Vernon, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 12, 1977, Ser. No. 859,715
Int. Cl.[2] F16D *3/00*
U.S. Cl. 403—57 8 Claims

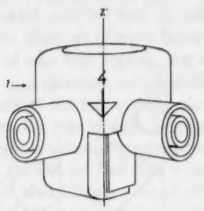


1. An improved flexure assembly comprising:
(a) a first member having a cross-shaped cross-section extending along a first axis;
(b) a second member having a cross-shaped cross-section extending along a second axis perpendicular to said first axis intersecting said first member and rigidly coupled thereto; and
(c) means on the two ends of each of said first and second members for attachment, whereby two operatively connected members between which there must be provisions for universal joint action can be coupled respectively to the means at the ends of said first member and the means at the ends of said second member, said flexure thereby providing for a stiffness to permit transmission of forces between said two members both along a third axis mutually perpendicular to said first and second axes and in a direction along said first, and second axes while permitting bending through small angles about said first and second axis.

4,128,353
ALLOCHIRALLY DIVIDED CONNECTOR FOR TUBULAR FRAME MEMBERS

Jacques V. Lauterbach, Saint Apollinaire, DiJon, France (21000)

Filed Dec. 19, 1977, Ser. No. 862,283
Claims priority, application France, Dec. 22, 1976, 76 39210
Int. Cl.[2] F16D *1/00*
U.S. Cl. 403—175 6 Claims

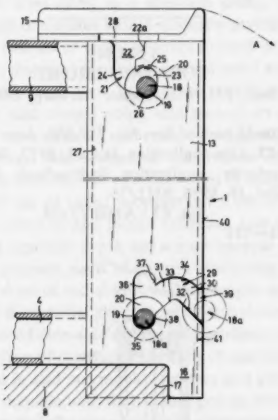


1. In a member for assembling tubular elements two half-shells which can be nested one on the other and each having an internal channel in the form of a semi-cylinder of revolution, and two parallel flat flanges, the internal spacing of which is equal to the internal diameter of said channel, and of which the length is equal to half the length of the latter, said two half-shells having the same axis when they are nested on one another.

4,128,354
KNOCK-DOWN CONTAINER SIDE PANEL CONNECTIONS

Erich Amrogowicz, am Bassberg 8, 8776 Heigenbrucken, Spessart, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,833
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 2701158
Int. Cl.[2] F16B *9/02*
U.S. Cl. 403—186 18 Claims



1. An arrangement for interconnecting components at adjacent upright marginal portions thereof, particularly wall components to form unitary box-shaped support structures therefrom, comprising, in combination, an upper and a lower connecting projection rigid with one of the respective adjacent marginal portions at the upper and lower regions thereof; and means at the upper and lower regions of the other respective adjacent marginal portion for defining an upper and a lower connecting slot for respectively receiving said connecting projections of said one marginal portion, said upper connecting

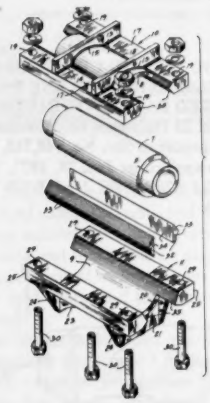
slot having a substantially L-shaped configuration and including a longer leg which opens onto and extends downwardly from the upper end face of said other marginal portion and a shorter leg which extends from said longer leg toward the side face of said other marginal portion, said lower connecting slot having a substantially inverted V-shaped configuration and including a first leg which opens onto and extends inwardly and upwardly from said side face of said other marginal portion and a second leg which extends inwardly and downwardly from said first leg.

4,128,355

FLEXIBLE JOINT FOR SUSPENSION SYSTEMS AND THE LIKE

Ronn J. Leaf, Lexington, Ky., assignor to Dura Corporation, Southfield, Mich.

Filed Jul. 11, 1977, Ser. No. 814,555
Int. Cl.[2] F16C *35/00*; F16F *1/38*
U.S. Cl. 403—222 **11 Claims**



1. A flexible joint for use in suspension systems and the like, comprising:

a rigid cylindrical inner member;

a resilient bushing encompassing said inner member;

a rigid casing comprising sections having opposed complementary semi-cylindrical compression surfaces holding said bushing under compression toward said inner member;

means securing said casing sections together in bushing compressing relation;

said casing sections being substantially joined together at partings located intermediate said surfaces;

rigid combination compression applying and barrier elements engaged by and between said bushing and said sections and extending across said partings and preventing extrusion of the compressed bushing into said partings;

said elements having compression surfaces for engaging and squeezing and displacing material of the resilient bushing, so that a predetermined spring rate prestressing of the bushing is effected whereby to improve the fatigue resistance and endurance of the bushing;

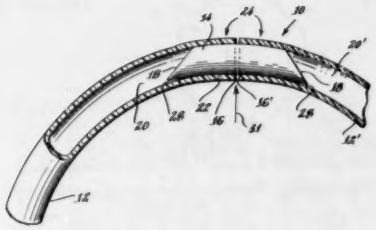
and means on said elements and on said casing sections cooperating for effecting thrusting of said elements into the bushing squeezing and bushing material displacing relation against the areas of the bushing engaged by said elements.

4,128,356

FRICTIONAL COUPLING DEVICE

Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580

Filed Nov. 26, 1976, Ser. No. 745,067
Int. Cl.[2] F16B *7/00*
U.S. Cl. 403—292 **25 Claims**



1. A coupling device comprising

an elongated outer element formed of a flexible, resilient, stretchable material having a hardness of at least 50 durometers, said outer element having a bore along at least one end portion thereof, said bore being bounded by a wall whose thickness is selected to exhibit sufficient resilience to obtain a self-reversible, cross-sectional area contraction of said end portion in response to a longitudinally applied tension force while exhibiting a self-reversible cross-sectional area increase of said end portion in response to a longitudinally applied compressional force; and

an elongated insert including at least a first portion sized to have an interference fit with said bore, said insert being free of protruberances along its outer surface and being formed of a material substantially harder than that of said outer element for developing enhanced frictional surface engagement with the inner surface of said wall when the latter tends to contract in response to tensional force applied to separate the insert from the outer element;

said outer element and said insert being made of materials having notably high surface friction when engaged with each other in the assembled state of the coupling device for resisting said applied tensional force and having considerably lower surface friction resisting entry of the insert into the bore of the outer element when the coupling device is being assembled, one of said elements being formed of vinyl.

4,128,357

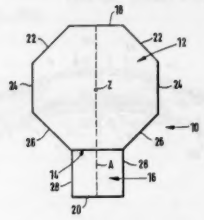
SLAB-ELEMENTS FOR COVERING THE GROUND

Günter Barth, 41 Grötzingen, 7500 Karlsruhe, and Fritz Von Langsdorff, Blumenstrasse 12, 7551 Förch, über Rastatt, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 672,727, Apr. 1, 1976, abandoned. This application Feb. 28, 1978, Ser. No. 882,250
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713354; Belgium, Mar. 29, 1976, 165663
Int. Cl.[2] E01C *5/00*
U.S. Cl. 404—41 **28 Claims**

1. Slab elements for paving ground areas, each of said elements being a single piece of concrete consisting of a head portion and a stem portion meeting at a dummy groove allowing, but not necessitating, breakage of said slab elements into heads and stems along said dummy grooves and being delimited by two opposite end faces of equal length joined by opposite sides that form angled traces about a longitudinal axis common to said head and said stem, each said angled trace being formed by a succession of sides comprising at said head an inclined side face inclined at 45° in one direction relatively to said axis, a lateral side face extending lengthwise with respect to said axis, and another inclined side face inclined at 45° in the opposite direction with respect to the said axis, and

comprising at said stem a lateral side face extending lengthwise with respect to said axis, each said lateral face of said stem being complementary to a lateral face of said head, said end face of said head together with said inclined sides of said head and said lateral faces of said head and said dummy groove



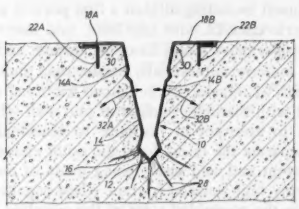
describing a centrally symmetrically octagon, said dummy groove together with said end face of said stem and said lateral faces of said stem being symmetrical about the center of said stem, and said head and said stem being mirror symmetrical about said longitudinal axis.

4,128,358

CONCRETE CONTROL JOINT

Marshall F. Compton, 114 Brandon, Conroe, Tex. 77301

Filed Sep. 19, 1977, Ser. No. 834,298
Int. Cl.[2] E04B *15/14*
U.S. Cl. 404—47 **3 Claims**



1. A concrete control joint fabricated of integral metallic stock comprising a substantially T-shaped member wherein the upright leg of the T is split substantially entirely along a plane extending vertically therethrough to thereby define first and second leg portions hingedly connected at the lower ends thereof, each of the leg portions having an arm connected thereto, a portion of each arm being folded beneath itself toward the leg portion with which it is associated to define a flap disposed adjacent to the undersurface of each arm, each flap having a finger extending substantially perpendicularly to the underside surface of the arm toward the lower hinged termini of the leg portions, each finger being spaced inwardly from the end of each arm toward the leg portion with which the arm is associated.

4,128,359

SELF-PROPELLED CONCRETE VIBRATOR APPARATUS

Charles R. Cooper, Jr., 1315 S. 3rd; Charles K. Ellis, 1608 N. 17th St., both of Beatrice, Nebr. 68301, and David Starcher, 517 Shepherd Dr., Mansfield, Ohio 44907

Filed Nov. 14, 1977, Ser. No. 851,361
Int. Cl.[2] E61C *19/38*
U.S. Cl. 404—72 **34 Claims**

32. The method of creating a bridge deck upon a bridge, comprising the steps of:

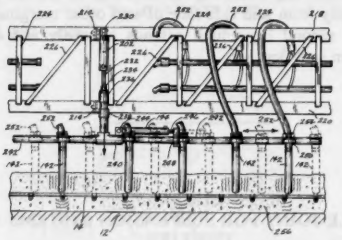
(a) positioning a pair of spaced-apart guide rails on opposite sides of the area upon which concrete is to be poured;

(b) pouring concrete on said area across the width thereof;

(c) positioning a self-propelled concrete vibrator machine on said guide rails whereby said vibrator machine extends between said guide rails;

(d) lowering a plurality of vertically disposed and horizontally spaced vibrator devices from said vibrator machine into said concrete;

(e) raising said vibrator devices from said concrete;



(f) moving said vibrator machine longitudinally along said guide rails; and

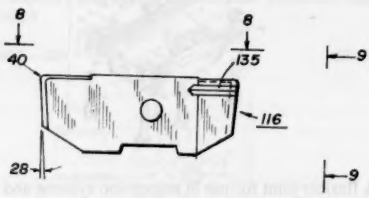
(g) finishing said concrete with a concrete finishing machine which is movably positoned on said guide rails closely adjacent said vibrator devices.

4,128,360

CUTTING TOOL BIT AND GRINDING FIXTURE FOR SHARPENING SAID BIT FOR USE IN AN AXIALLY ACTUATED BACK SPOT FACING TOOL

Henry F. Swenson, 22 Holmehill Ln., Roseland, N.J. 07068

Continuation-in-part of Ser. No. 748,715, Dec. 8, 1976, abandoned. This application Jun. 28, 1977, Ser. No. 810,902
Int. Cl.[2] B26D *1/00, 1/12;* B23B *51/16*
U.S. Cl. 407—114 **8 Claims**



1. A cutting tool bit for use in an axially actuated back spot facing tool, said tool bit of hardened material and having cutting edges along one side of the tool bit and diametrically oppositely disposed around a theoretical center and including: (a) a pivot hole of a precise diameter and establishing a theoretical center line of the tool bit, this pivot hole placed a selected distance from the rear edge of the tool bit; (b) a precise recess formed in one edge of the tool bit and on the side opposite the cutting edge, this recess sized to slidably engage an end of a cam rod mounted in and carried by the axially actuated back spot facing tool, the precise recess at a determined depth to establish the positioning of the tool bit on the entered end of the cam rod; (c) a guide chamfer formed at the entering end of this recess, said chamfer providing a guide path for the entrance and seating of the cam rod of the spot facing tool in said recess; (d) a cutting edge formed in one extension of the tool bit and as it is rotated with and by the tool this cutting edge generates a full sweep of the spot face, said cutting edge formed on that portion of the tool bit that extends beyond a supporting shank portion of the back spot facing tool, this cutting edge having a top relief, a front face relief, a backward slope and a compensation of these slopes with the front edge formed at a relief so that the cutting edge is at a true right angle to the theoretical axis of the tool bit, the cutting extension further

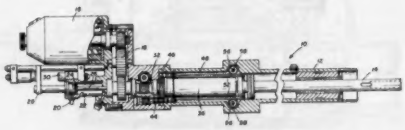
having an end relief to the cutting edge and a chamfer formed on the cutter tool bit corners opposite the cutting edge, and (e) a cutting edge formed on the opposite tool bit extension, this extension having a length of about three-quarters the length of the effective cutting extension end, this shorter extension having a cutting edge of like front, top, backward slope, end and back corner chamfer and compensation for the front edge as is provided on the cutting edge formed on the full tool bit extension.

4,128,361

LOCKING MEANS FOR POSITIVE FEED DRILL

Robert F. Golwas, La Habra, and Herman G. Feuerstein, Hacienda Hts. both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 23, 1977, Ser. No. 799,427
Int. Cl.[2] B23C 1/16; B23B 29/32
U.S. Cl. 408—137 **3 Claims**



1. In a positive feed drill including a housing, an externally threaded hollow feed screw rotatably and telescopically carried by the housing, and drill tool holder means rotatable with respect to the housing and feed screw arranged to be extended by the feed screw, improved locking means for causing axial movement of the feed screw and tool holder relative to the housing, comprising:

a shaft journaled in the housing and oriented therein generally perpendicularly with respect to the feed screw;

thread engaging means in engagement with the external thread on the feed screw, said thread engaging means being mounted on said shaft and rotatable therewith;

a toothed gear mounted on said shaft and rotatable therewith;

non-rotatable gear means having teeth thereon for mating with said toothed gear, said non-rotatable gear means being movable in the housing between a first position wherein said teeth are not in mating engagement and a second position wherein said teeth are in mating engagement thereby preventing rotation of said shaft and causing said feed screw and tool holder to move axially relative to the housing; and

means in the housing for moving said non-rotatable gear means between said positions, said means including:

a pressure-responsive piston having one end in engagement with said non-rotatable gear for moving said non-rotatable gear into said second position,

a fluid supply tube located in the housing and said piston is annular and slidingly and sealingly encircles a portion of said supply tube,

said non-rotatable gear means is slidingly located on said supply tube,

a spring having one end engaging the housing and the other end engaging said non-rotatable gear for moving said non-rotatable gear into said first position, and

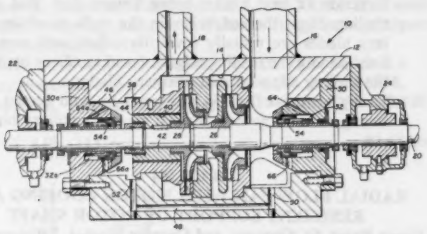
said spring encircles a portion of said supply tube on the opposite side of said non-rotatable gear means relative to said piston.

4,128,362

FLUSHING AND COOLING SYSTEM FOR PUMPS

Wilburn O. Shepherd, Whittier, and Jonathon C. Gaslow, La Palma, both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 22, 1977, Ser. No. 790,159
Int. Cl.[2] F01D 11/10
U.S. Cl. 415—112 **5 Claims**



1. An improved flushing and cooling system for shaft seals in pumps that include a shaft carrying an impeller for moving liquid through the pump, a hollow housing journaling the shaft, the housing having inlet and discharge openings therein, the improvement comprising:

an enclosed seal cavity formed in the housing encircling a portion of the shaft;

inlet and outlet ports in the housing providing fluid communication between the interior of the housing and said cavity; and,

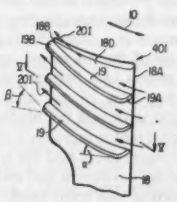
seal means located in said cavity for forming a seal between the housing and shaft, said seal means including pumping means rotatable with said shaft for moving fluid from the interior of the housing through said inlet port, past said seal means for flushing and cooling said seal means, and outwardly through said outlet port to the interior of the housing whereby the fluid being pumped is utilized to cool and lubricate said seal means.

4,128,363

AXIAL FLOW FAN

Kenji Fujikake; Haruo Katagiri, and Katsuhito Yamada, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Apr. 30, 1976, Ser. No. 681,775
Claims priority, application Japan, Apr. 30, 1975, 50-58988[U]; Apr. 30, 1975, 50-58989[U]; Apr. 30, 1975, 50-58990[U]; Nov. 7, 1975, 50-152509[U]; Feb. 27, 1976, 51-23737[U]
Int. Cl.[2] F04D 29/38
U.S. Cl. 416—236 A **18 Claims**



1. An axial flow fan comprising:

a hub member rotatably supported and driven by a drive source;

a plurality of blades having a predetermined angle with respect to the rotational direction thereof and a predeter-

mined width and height, said blades being radially provided on said hub member; and

a plurality of auxiliary blades disposed upon and projecting from each of at least two of said blades, the leading edges of said auxiliary blades, as viewed in the direction of the rotational axis thereof, being spaced closer to the rotational center of said hub member than the trailing edges of said auxiliary blades, a distance between two adjacent auxiliary blades at said leading edges thereof in said radial direction of said blades being longer than that at said trailing edges thereof, wherein the surfaces of the auxiliary blades are radially inwardly offset with respect to lines joining the leading edges of said auxiliary blades and the trailing edges of said auxiliary blades,

whereby an axial flow is produced by said blades and a strong radial flow is produced by said auxiliary blades.

4,128,364

RADIAL FLOW FAN WITH MOTOR COOLING AND RESILIENT SUPPORT OF ROTOR SHAFT

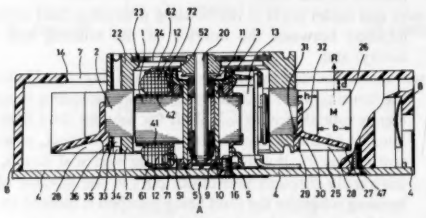
Georg Papst, St. Georgen, and Guenter Wrobel, Villingen, both of Germany, assignors to Papst-Motoren KG, Germany

Division of Ser. No. 418,213, Nov. 23, 1973, Pat. No. 3,961,864. This application Mar. 31, 1976, Ser. No. 672,143

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1972, 2257509

Int. Cl.[2] F04B *35/04, 39/06;* **F04D** *29/42;* **H02K** *5/24*

U.S. Cl. 417—354 **11 Claims**



1. A radial flow fan comprising:

fan wheel means which includes a plurality of fan blades and is rotatable about a fan wheel axis,

drive motor means arranged coaxially with respect to the fan wheel means for imparting rotational movement to said fan wheel means, at least part of said drive motor means being arranged within the fan wheel means intermediate the outer periphery of the fan wheel means and the fan wheel axis, said drive motor means including a stator and a rotor,

fan casing means including circumferentially extending casing wall means which extend circumferentially around said fan wheel means at a spacing therefrom, and casing end wall means at each of the respective opposite axial end faces of said circumferentially extending wall means,

outlet port means provided in said circumferentially extending wall means for accommodating discharge of gas out of said casing means in a radial direction with respect to the axis of rotation of the fan wheel means,

and inlet port means in a first of said end wall means for accommodating flow of gas into said casing means in communication with said fan blades,

wherein said drive motor includes a centrally disposed rotor shaft which rotates about said fan wheel axis, and wherein a contact disc is provided at one end of said rotor shaft for axially supporting said rotor shaft,

wherein said one end of said rotor shaft is rounded and smoothly polished for contacting a correspondingly smoothly polished contact surface of said contact disc,

wherein said contact disc is supported directly at the second end wall means,

wherein said contact disc includes a central portion engageable with said rotor shaft and peripheral leg portions for maintaining the side of said central portion facing away from said rotor shaft at a spacing from said second end wall means, whereby shock forces from said rotor shaft are resiliently absorbed by resilient deformation of said central portion in a direction toward said second end wall means and

wherein said contact disc further includes a projection for limiting the resilient deformation of said central portion which extends from said central portion toward said second end wall means.

4,128,365

FUEL SUPPLY UNIT

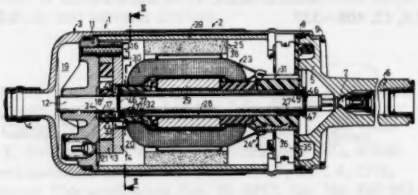
Ulrich Kemmner, Sachsenheim, and Karl Ruhl, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,625

Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619094

Int. Cl.[2] F04B *17/00*

U.S. Cl. 417—423 R **10 Claims**



1. A fuel supply unit comprising a pump having a rotor and an electromotor having an armature, a rigid mounting shaft common to said pump rotor and said electromotor armature, first bearing means for rotatably mounting said pump motor on said shaft, second bearing means for rotatably mounting said armature on said shaft, independently of said pump rotor, axially extending tenons connected with said motor armature, means for supporting said tenons on said armature in rotation-locking connection with said pump rotor and thereby serve as the only means for coupling said armature and said rotor together.

4,128,366

ROTOR HOUSING FOR A ROTARY ENGINE

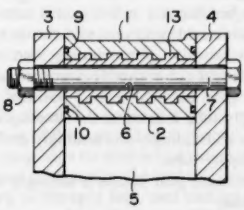
Shigeru Sone, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 29, 1977, Ser. No. 792,206

Claims priority, application Japan, Dec. 24, 1976, 51-156736

Int. Cl.[2] F01C *21/06, 21/10*

U.S. Cl. 418—83 **4 Claims**



1. A rotor housing for a rotary engine, comprising an annular body member having a plurality of axial through bores arranged therealong and being adapted to receive through bolts which clamp said rotor housing together with a side or intermediate housing, some of said bores being lined with a

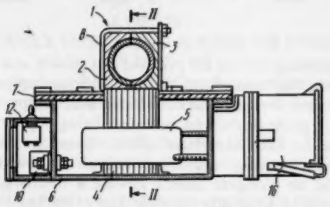
collar member made of a material having a lower thermal expansion coefficient than said annular body, said collar member having a serrated external shape when viewed in longitudinal cross section and being anchoringly embedded in said annular body so as to restrain axial thermal expansion of said annular body while it defines said through bore therethrough.

4,128,367

CABLE REPAIR VULCANIZING PRESS

Nikolai M. Shakula, ulitsa Moskovskaya, 3a, kv. 31, Kommunarsk Voroshilovgradskoi oblasti; Nikolai I. Voloschenko, Selskokhozyaistvennaya ulitsa 19, kv. 108, Moscow; Nikolai F. Shishkin, poselok VUGI 9, kv. 22, Ljubertsy Moskovskoi oblasti; Anatoly S. Muratov, ulitsa Jubileinaya 16, kv. 15, Podolsk Moskovskoi oblasti; Alexandr P. Guzchenko, ulitsa 13 Linia, 5, kv. 26, Voroshilovgrad; Vladimir M. Anokhin, ulitsa Belinskogo, 1, kv. 9, Kommunarsk Voroshilovgradskoi oblasti, and Vladimir F. Nikitchenko, Karierny tupik 8, Voroshilovgrad, all of U.S.S.R.

Filed Nov. 2, 1977, Ser. No. 847,751
Int. Cl.[2] B29H *9/11*; B29C *3/00*
U.S. Cl. 425—11 **9 Claims**



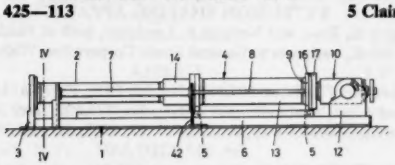
1. A cable repair vulcanizing press comprising a split mould adapted to receive a cable being repaired, and an inductor having a multi-leg core and intended to generate and transmit an alternating magnetic flux to the split mould, said core and said split mould being mutually arranged so that the separating line of the split mould lies in the plane of the magnetic flux flowing in the legs of said multi-leg laminated core.

4,128,368

APPARATUS FOR INSULATING AND TREATING ELECTRICAL CONDUCTORS

Gilbert Magnollay, Romanel, Switzerland, assignor to Mailliefer S.A., Ecublens, Switzerland

Continuation of Ser. No. 667,343, Mar. 16, 1976, abandoned. This application Oct. 12, 1977, Ser. No. 841,464
Int. Cl.[2] B29F *3/10*; B29D *23/05*
U.S. Cl. 425—113 **5 Claims**



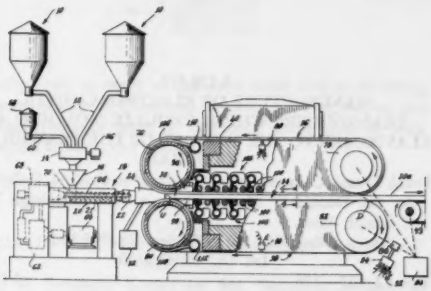
1. In a plant arranged for continuously applying and treating an insulating jacket on an electrical conductor advancing from an upstream end toward a downstream end through said plant, an extruder, an extruder head fed from said extruder and surrounding said conductor, an elongated stationary chamber, a tube having a common axis with said chamber, said tube being mounted for telescoping movement with respect to said chamber, an annular plate secured at an upstream end of said tube, said extruder head having a flat front face, means mounting said head for free rotation about an axis perpendicular to said common axis, means for displacing said tube to press said annular plate against said flat front face, thereby causing said face to pivot to permit parallel alignment to said flat front face with said annular plate thus to seal said head to said tube.

4,128,369

CONTINUOUS APPARATUS FOR FORMING PRODUCTS FROM THERMOPLASTIC POLYMERIC MATERIAL HAVING THREE-DIMENSIONAL PATTERNS AND SURFACE TEXTURES

William J. Kemerer, Pittsburgh, Pa., and Clyde W. Vassar, Cholchester, Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Division of Ser. No. 639,328, Dec. 10, 1975, which is a continuation-in-part of Ser. No. 538,645, Jan. 6, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 726,928
Int. Cl.[2] B29D *7/22*
U.S. Cl. 425—113 **32 Claims**



1. Apparatus for continuously impression molding products of thermoplastic polymeric material having a three-dimensional pattern thereon comprising:

means for feeding a heated ribbon containing heated thermoplastic polymeric material in a plastic state,

said heated thermoplastic material being at an elevated temperature above its glass transition temperature,

a pair of flexible endless belt molds,

each of said belt molds being revolvable under tension,

a plurality of rolls operatively associated with said flexible belt molds for revolving said flexible belt molds under tension in opposed face-to-face relationship travelling along together forming a travelling mold channel extending from an upstream position to a downstream position for advancing said material along between said belt molds,

said rolls including a pair of nip rolls directly opposite each other near said upstream position engaging the respective revolving belt molds with each of the revolving belt molds curving partially around its nip roll and converging toward the other curving belt mold at said upstream position for squeezing said heated ribbon between said revolving belt molds at said upstream position in a localized rolling squeezing action against opposite sides of said heated ribbon as the heated ribbon is entering the travelling mold channel,

at least one of said flexible belt molds including a flexible three-dimensional mold pattern including abrupt changes in contour both longitudinally and laterally of the mold pattern for impressing a three-dimensional pattern into the heated thermoplastic material being squeezed between said belt molds at said upstream position for forming products having a three-dimensional pattern thereon defining abrupt changes in contour both longitudinally and laterally of the products,

cooling means operatively associated with said revolving belt molds for cooling the revolving belt molds for cooling the impressed thermoplastic material in said travelling mold channel being advanced along between said belt

molds into its memory retention state after said pattern has been impressed thereon,

supporting means located between said upstream position and said downstream position engaging the revolving belt molds for pressing the revolving belt molds toward each other along said travelling mold channel for retaining said impressed pattern in the thermoplastic material as it is being cooled into its memory retention state, and

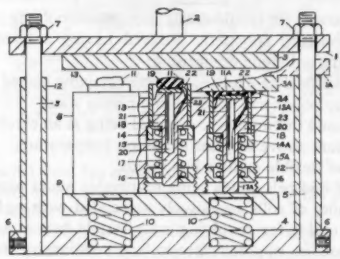
means downstream from said mold channel for removing the cooled impressed products from between said belt molds at said downstream position.

4,128,370

MANUFACTURE OF ELECTROACOUSTIC TRANSDUCERS WHICH REQUIRE MOLDING AN ELASTOMER TO THE SURFACE OF THE TRANSDUCER MATERIAL

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees, The Stoneleigh Trust, Cohasset, Mass.

Filed May 12, 1977, Ser. No. 796,350
Int. Cl.[2] B29C *6/00*
U.S. Cl. 425—128 **3 Claims**



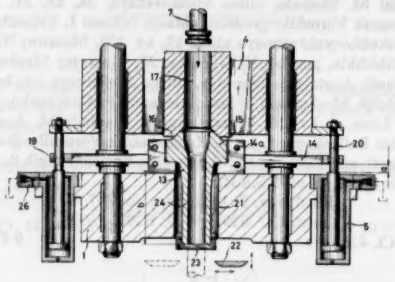
1. In combination in a system for molding a layer of sound conducting material of precise dimensions to the surface of an electroacoustic transducer element whose electroacoustic characteristics are permanently changed if the element is subjected to a pressure in excess of a specified magnitude, a mold comprising a lower base portion and a heated upper plate portion, said lower base portion including a cavity portion with a mechanical insert support means for precisely locating a transducer element within said cavity, a press comprising a rigid base member and a movable plate member, compliant support means for floatingly supporting said mold between said rigid base member and said movable plate member, said compliant support means includes a spring member interposed between either of said press members and said mold, force means supplied by said press for moving said movable plate member towards said rigid base member to force said heated upper plate portion of said mold toward said lower base portion to close said mold, whereby a precisely dimensioned closed cavity results within said mold, said force supplied by said press for closing said mold is applied to said mold through said spring member, means for limiting the maximum displacement of said spring member upon closing said mold whereby said maximum spring displacement fixes the maximum magnitude of force which is being applied through said spring member to hold said mold closed during the molding operation.

4,128,371

DEVICE FOR PRESSING OUT MATERIAL IN THE FORM OF A STRAND

Eugen Kopp, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Jun. 9, 1977, Ser. No. 804,870
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704832
Int. Cl.[2] B29F *3/00*
U.S. Cl. 425—192 R **8 Claims**



1. A pressing device for pressing out pliable and pulverized material in the form of a strand, said device comprising:

a container for the material to be pressed out; parallel spaced apart guide posts, said container being supported by said posts for axial movement relative thereto; a pressure table having a passage extending through the thickness of said table, an elongate matrix having a discharge end, said matrix being axially movable and extending through said passage in said container into confronting relation with said container for pressing material from the container out of the matrix; a piston coacting with the container and matrix for pressing material through the matrix; a matrix pan including two parts, means detachably connecting said two parts of the matrix pan, said pan removably supporting said matrix, means supporting said pan for axial displacement relative to the pressure table, said guide posts engaging and guiding one part of the matrix pan when said one part is axially displaced; and drive means operatively associated with the container for axially displacing said container away from said matrix and means coupling said drive means and said pan for displacing said pan and the matrix therewith together with said container after the container has been displaced away from said matrix by a predetermined lift distance.

4,128,372

EXTRUSION SHAPING APPARATUS

Larry E. Rose, and Norman F. Lawrence, both of Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

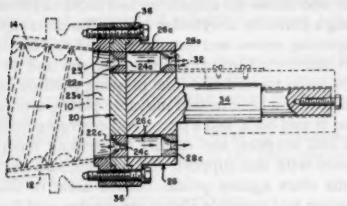
Division of Ser. No. 591,575, Jun. 30, 1975, Pat. No. 4,051,162, and a continuation-in-part of Ser. No. 429,305, Dec. 28, 1973, abandoned. This application Jul. 15, 1977, Ser. No. 816,106
Int. Cl.[2] A21C *3/04*
U.S. Cl. 425—311 **5 Claims**

1. An improved extrusion shaping apparatus for continuously producing an assortment of extrusion puffed dough shapes, all at substantially the same linear extrusion velocity, comprising:

(a) a rotatable extrusion screw for feeding a gelatinized cereal mixture from a confined zone of high pressure to a die means for exit to an unconfined zone of lower pressure;

(b) a die means having a plurality of restricted die orifices of varying cross-section and shape, for shaping the cereal mixture as it passes from the confined zone to the unconfined zone where it expands; and

(c) modulating backup means, positioned between the extrusion screw and the die means and having a plurality of flow adjusting chambers, each of the chamoers being in communication with one of the restricted orifices, and



each of the flow adjusting chambers being of suitable size and configuration to modulate the flow of cereal mixture through its respective restricted die orifice, such that the dough is expressed from all of the restricted die orifices at substantially the same linear extrusion velocity.

4,128,373

CONTINUOUSLY OPERATING ROUGH OR FINISHING PRESS

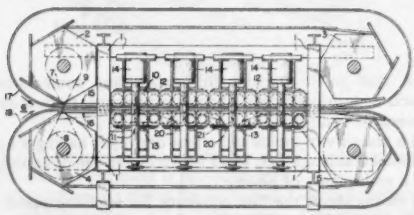
Ernst Greten, Springe, Fed. Rep. of Germany, assignor to Bisonwerke Bähre & Greten GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,573

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2657040

Int. Cl.[2] B29C *15/00;* **B30B** *5/06;* **B24J** *5/10*

U.S. Cl. 425—371 **36 Claims**



1. An endless band arrangement for a continuously operating rough or finishing press, the arrangement comprising: a plurality of individual plate elements, means for pivotally connecting the plate elements to each other to form an endless plate band, and means provided in at least one surface of each of said plate elements for minimizing deformation of the plate elements during an operation of the press.

4,128,374

INJECTION BLOW MOLDING APPARATUS

Robert W. Saumsiegle, Needham, and Ieuan L. Harry, Billerica, both of Mass., assignors to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 312,257, Dec. 5, 1972, Pat. No. 3,941,539. This application Sep. 23, 1975, Ser. No. 616,006

Int. Cl.[2] B29D *23/03*

U.S. Cl. 425—403 **9 Claims**

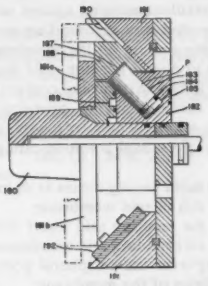
1. A core assembly for blow molding apparatus comprising

a core element having an axis,

a core mounting base,

a plurality of neck mold sections disposed about the core element,

means for causing the neck mold sections to move simultaneously longitudinally and transversely with respect to the core element axis, said means including a plurality of hollow pins angularly fixedly mounted on the core mounting base and neck mold section mounting means slideably mounted on the pins, means forming a fluid seal between the pins and the neck mold section mounting means, and means for supplying fluid under pressure through the



hollow pins to react on said neck mold section mounting means to thereby effect said simultaneous longitudinal and transverse movement of said neck mold sections with respect to said core element axis.

4,128,375

APPARATUS FOR PRODUCING PLATES AND SIMILAR ARTICLES

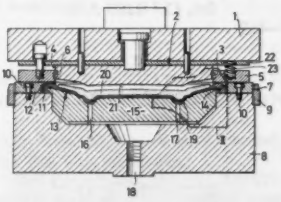
Rolf E. R. Schubart, Kochel am See, Germany, assignor to Dorst-Keramikmaschinen-Bau Otto Dorst u. Dipl.-Ing. Walter Schlegel, Kochel am See, Germany

Filed Jun. 6, 1977, Ser. No. 803,610

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2627160

Int. Cl.[2] B30B *5/02, 5/04, 11/04;* **B28B** *7/26, 3/02*

U.S. Cl. 425—405 H **13 Claims**



1. A press for the production of articles of low silhouette such as plates including:

a mold having a cavity;

a rigid upper pressing punch having a lower profile shaped in accordance with the interior shape of the article to be pressed and adapted for downward travel toward said cavity;

an elastic membrane having a peripheral rim, said elastic membrane sealing the top of said cavity of said mold and secured at said rim, said membrane having a recess therein corresponding to the shape and dimensions of the article to be pressed for receiving a pulverulent porcelain composition, said membrane including an annular groove for shaping the foot of the plate, said elastic membrane having a relaxed position with a shape corresponding to the shape of the lower surface of the article, and being of substantially uniform thickness, which thickness is sufficient that it can be deformed for filling with the pulverulent material and return to its relaxed position;

means providing a source of vacuum connected to said cavity for drawing said membrane downwardly into said

cavity to position it for receipt of said pulverulent material;

means providing a source of fluid pressure connected to said cavity for applying pressure to said membrane and the pulverulent porcelain composition on said membrane when said pressing punch is lowered on the pulverulent porcelain composition for deflecting the membrane to press the pulverulent material against said punch;

a resiliently mounted ring surrounding said upper pressing punch, said ring seating on the membrane rim when the punch moves to closed position, said ring and said upper pressing punch having opposing contact surfaces, each of said contact surfaces having opposing grooves which together form a hollow annular cavity, a said means providing source of vacuum communicating with said annular cavity;

an insert for the mold having means at its inner edge interfitting with the rim of said membrane;

a securing ring for securing said insert rim in said lip, said securing ring surrounding said membrane and including a step for fitting over the peripheral portion of the upper surface of the rim of the membrane;

fluid passage channels through said insert;

a residual space in the top profile of the insert in the vicinity of the channels for exposing the membrane to the vacuum when the same is applied to said insert channels to draw the membrane snugly against the top profile of the insert; and

said insert having outer and inner parts, said inner part being adjustable vertically and including a platen which rests against the central lower part of said membrane, thereby facilitating molding of angled sides of the article spring urging said inner part into raised position.

4,128,376

PRESSING ARRANGEMENT FOR COMPRESSING CERAMIC AND REFRACTORY MATERIALS INTO TILE PREFORMS

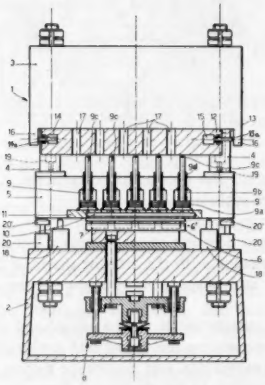
Sergio Albertazzi, via Lambruschini 4, Imola-Bologna, Italy

Filed Oct. 12, 1977, Ser. No. 841,727

Claims priority, application Italy, Oct. 28, 1976, 28787 A/76

Int. Cl.[2] **B28B** *3/06*

U.S. Cl. 425—415 **11 Claims**



1. A pressing arrangement, particularly for compressing ceramic and refractory materials into tile preforms, comprising a frame including a stationary platen, a stationary support and a plurality of elongated beams extending between said stationary platen and said support; a movable platen mounted on said beams for displacement longitudinally of the latter between a retracted position and a final pressing position; means for displacing said movable platen between said positions thereof; a mold having two mold sections one mounted on said stationary platen and the other on said movable platen for joint displacement therewith in registry with said one mold section, said mold being open in said retracted position of said movable platen to permit at least the withdrawal of the preforms from said mold, and said mold sections compressing the materials in said mold as said movable platen approaches said final pressing position; and means for subjecting said mold to pressing forces, including a plurality of cylinder-and-piston units separate from said displacing means and distributed over said movable platen to exert distributed pressing forces thereon and to uniformly press the same toward said final pressing position each of said units including a bore in said movable platen, a piston accommodated in said bore, and a piston rod emerging from said bore toward said support; and further comprising reaction means juxtaposed with said support, and wherein said piston rods of said units abuts against predetermined areas of said reaction means when said movable platen approaches said final pressing position and said units are energized.

4,128,377

UNMOULDING MACHINE FOR CONFECTIONARY PRODUCTS

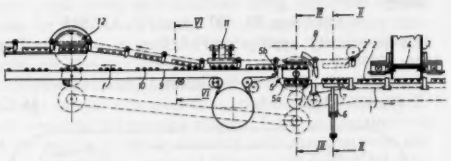
Carlo Bramati, Milan, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Filed May 5, 1977, Ser. No. 794,260

Claims priority, application Italy, Aug. 6, 1976, 26108 A/76

Int. Cl.[2] **A23G** *1/26;* **B65G** *65/02*

U.S. Cl. 425—439 **4 Claims**



1. A dual mode machine for unmoulding confectionery products and, in particular, chocolate products, from moulds said machine comprising:

(A) a plurality of molds and a first conveyor having a horizontal reach at a first level for receiving filled moulds,

(B) a multiplicity of plates,

(C) means above the first conveyor for applying plates on the tops of the moulds on the first conveyor,

(D) a second conveyor downstream of the plate applying means,

(i) said second conveyor having a horizontal reach at a second level which is higher than said first level of said horizontal reach of the first conveyor;

(ii) said horizontal reach of the second conveyor having a portion overlying a portion of the horizontal reach of the first conveyor;

(E) a vertically translatory lifting device downstream of the plate applying means for raising moulds from the horizontal reach of the first conveyor to the horizontal reach of the second conveyor,

(F) a rotating device downstream of the lifting device for accepting moulds from the first conveyor, inverting said accepted mould moulds and raising said inverted and accepted moulds to a horizontal position immediately below a position of said reach of the second conveyor,

(G) a third conveyor having a horizontal reach starting downstream of the rotating device,

(i) said horizontal reach of the third conveyor being at a level that is the same as the level of an inverted mould lifted by the rotating device,

(ii) said horizontal reach of the third conveyor being below the horizontal reach of the second conveyor and partially coextensive therewith downstream of the rotating device,

(H) said reach of the second conveyor including a portion sloping upwardly from the horizontal portion thereof and located above a downstream portion of the third conveyor,

(i) said upwardly extending reach of the second conveyor engaging inverted moulds on the third conveyor and raising said moulds off moulded product left on the third conveyor;

(I) whereby filled moulds may be processed either by,

(i) transferring filled moulds from the first conveyor to the second conveyor by the lifting means and bypassing the rotating device, or

(ii) by transferring filled moulds from the first conveyor to the rotating device and then to the third conveyor and bypassing the lifting device.

4,128,378

EQUIPMENT FOR PRODUCING HIGH VOLTAGE RECTIFYING UNITS

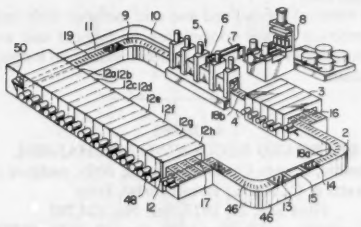
Shinpei Otsu, Yokohama; Akira Sekiguchi; Nobuyoshi Tobita, both of Kamakura; Shigeru Chikamatsu, Fujisawa; Yoshihisa Hosoe; Motoaki Matsui, both of Yokohama; Noboru Sugimoto, Yokosuka, and Noriyoshi Totsuka, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 26, 1977, Ser. No. 836,594

Claims priority, application Japan, Sep. 29, 1976, 51-115913

Int. Cl.[2] B29C *25/00*

U.S. Cl. 425—445 **5 Claims**



1. An equipment for producing a high voltage rectifying unit, which equipment is provided with:

(a) a defoaming means for storing and vacuum-defoaming a resin ingredient and a curing agent, respectively, alone;

(b) a mixing means for mixing said resin ingredient and said curing agent at a prescribed mixing ratio which is connected with said defoaming means by a closed piping;

(c) a vacuum injecting chamber for injecting an appointed amount of the mixed and defoamed thermosetting resin composition into an assembled high voltage rectifying unit in a vacuum state through injecting nozzles connected with said mixing means by a closed piping, which vacuum injecting chamber is equipped with the first carrier apparatus which may load and intermittently carry said high voltage rectifying unit;

(d) a defoaming chamber for defoaming the resin composition injected into the high voltage rectifying unit by evacuating to an appointed degree of vacuum which is provided adjacent to said vacuum injecting chamber and is equipped with the second carrier apparatus which may load and carry the inserted high voltage rectifying unit;

(e) a curing furnace for heating and curing continuously the resin composition-injected high voltage rectifying unit so that an appointed temperature profile may be formed along the carrying route of the third carrier apparatus, which is equipped with said third carrier apparatus for carrying the resin composition-injected high voltage rectifying unit through the curing furnace; and

(f) the fourth carrier apparatus for carrying said high voltage rectifying unit from said defoaming chamber to said curing furnace, which fourth carrier apparatus is covered to isolate the external atmosphere, and in which equipment the procedures from the vacuum injection of the thermosetting resin composition into the high voltage rectifying unit to the curing of the resin composition can thereby be carried out continuously and automatically.

4,128,379

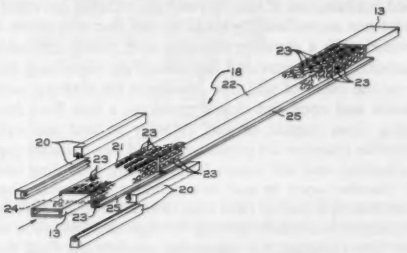
APPARATUS FOR PROCESSING EXTRUDED THERMOPLASTIC POLYMER

Joachim E. Hartitz, Avon Lake; Sam D. Nehemy, Lorain, and Erwin R. Wahl, Avon Lake, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 23, 1977, Ser. No. 809,230

Int. Cl.[2] B29C *25/00*

U.S. Cl. 425—446 **9 Claims**



1. An apparatus for annealing hollow plastic articles comprising a housing having an inner wall surface for supporting and guiding continuously therethrough a contoured plastic article, said housing having an inlet opening at one end and an outlet opening at the other end for guiding the plastic article thereinto and therefrom, said housing having a plurality of perforations throughout the length thereof, and a plurality of heater means spaced peripherally around the length of said housing for heating a portion of the contoured article passing through said housing.

4,128,380

FLUID PRESSURE ACTUATED DRIVE FOR THE CLOSING UNIT OF AN INJECTION MOULDING MACHINE

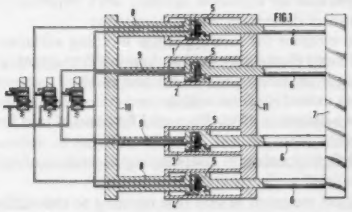
Helmut Jamann, Neustadt, Fed. Rep. of Germany, assignor to Dr. Boy KG, Fed. Rep. of Germany

Filed Oct. 1, 1976, Ser. No. 728,727

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 2544105

Int. Cl.[2] A01J *21/00;* **F15B** *11/00*

U.S. Cl. 425—450.1 **14 Claims**



1. In a hydraulic mold closing unit of an injection molding machine, an improved fluid pressure actuated drive for providing a to and fro transverse motion of a movable part of said unit, said drive including a piston rod defining an axis, a double acting piston mounted on one axial end of said rod, a cylinder passing said rod through one axial end and receiving said piston to form two expansible chambers on opposite axial sides

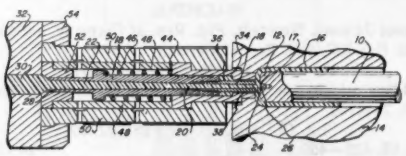
of said piston, one of said piston rod and cylinder being stationary and the other being drivingly attached to the movable part, a plurality of flow channels extending through said piston from one expansible chamber to the other expansible chamber, a disc mounted on said piston for limited rotation with respect to said piston about the axis between closed and opened positions, said disc having a plurality of flow channels extending through it in axial alignment respectively with the flow channels of said piston in said open position to freely provide the flow of fluid from one expansible chamber to the other expansible chamber and being completely out of alignment in said closed position to prevent the flow of fluid from one chamber to the other, said piston and disc together forming at least two expansible disc chambers for pressurization of one disc chamber with a fluid to move said disc into said open position and for pressurization of the other disc chamber with a fluid to move said disc into its closed position, one of said disc and piston being provided with at least one recess and the other of said disc and piston being provided with a shoulder dividing said recess into said disc chambers, means provided for selectively supplying fluid to one or the other of said disc chambers for rotating said disc between said open and closed positions, a first fluid duct extending from outside of said cylinder to said one cylinder expansible chamber for pressurizing said one cylinder expansible chamber, and said means for supplying providing said one disc chamber open to said one cylinder expansible chamber and including a second fluid duct isolated from said one cylinder chamber and axially passing through said piston rod to said other disc chamber for supplying pressurized fluid to said other disc chamber to rotate said disc to its closed position to isolate the cylinder expansible chambers on opposite sides of said piston and passage means connecting said other disc chamber to said other cylinder expansible chamber when said other disc chamber is subjected to fluid pressure.

4,128,381

SYSTEM FOR PREVENTING MANDREL DEFLECTION IN MOLDING OF THERMOPLASTIC MATERIALS

Laszlo J. Bonis, Framingham, Mass., assignor to Composite Container Corporation, Natick, Mass.

Continuation of Ser. No. 713,791, Aug. 12, 1976, abandoned.
This application Jan. 30, 1978, Ser. No. 873,655
Int. Cl.[2] B29F *1/03;* B29D *23/02;* B29C *1/06*
U.S. Cl. 425—468 **2 Claims**



1. Apparatus for injection molding with improved freedom from mandrel deflection which comprises

a mold element for forming outer molding surfaces,

said mold element including therein a first opening extending from a first end to a second end and a second opening extending from said second end of said first opening in a direction away from said first end of said first opening,

said first opening in use shaping a portion of said outer molded surfaces,

a mandrel mounted in said first opening to extend longitudinally therin therealong from a first mandrel end to a second mandrel end, first and second ends of said mold element and said mandrel being each in the same direction relative to the other,

said mandrel being cantilevered from a mounting at said first end of said mandrel and having an outside surface defining in use inner molded surfaces,

a sleeve,

said sleeve being mounted in said second opening, and having a tip in use shaping therearound a further portion of said outer molded surfaces,

thermoplastic material supply means,

a mandrel second end centering member,

said member being mounted for reciprocal movement toward and away from said mandrel second end,

said member having therethrough a passage for moving thermoplastic material from said supply means into a cavity between said mold element and said mandrel,

said member including a first surface interfering with flow of said thermoplastic material therethrough and urged thereby toward said mandrel second end,

said member including a second surface positioned around said passage and in parallel flow relation to said cavity to receive thermoplastic material as said cavity fills and thereby exert on said member a force urging said member away from said mandrel second end, and

said member including a third surface for coacting with further biasing means biasing said member away from said mandrel second end, and

said further biasing means,

forces on said first surface overriding the sum of the forces on said second surface and said third surface to hold said centering member in centering engagement with said mandrel second end until a portion of said cavity is filled, whereupon said forces on said second surface and said third surface override said forces on said first surface whereby said member is moved away from said mandrel second end,

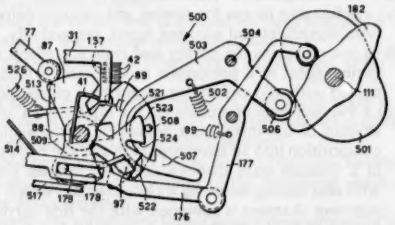
said mandrel second end and said member each including centering means cooperating to support said mandrel centrally in said cavity until said sum is no longer overriden.

4,128,382

KEYBOARD RECOCKING MECHANISM

Gillio Claudio, Brosso Canavese (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Sep. 19, 1977, Ser. No. 834,785
Claims priority, application Italy, Sep. 22, 1976, 69273 A/76
Int. Cl.[2] B41J *23/08, 5/24*
U.S. Cl. 400—478 **13 Claims**



1. A keyboard for a printing machine comprising a series of depressable keys; a series of intermediate members associated with said keys and each selectable by depression of one of said keys; a common actuator actuatable from an inoperative position to an operative position; spring means moving said common actuator to said operative position in response to moving of each of said keys, said common actuator engaging the selected intermediate member and moving said selected intermediate member to a predetermined speed; operative means associated to said intermediate members for performing a selected operation upon movement of said intermediate members; reloading means operative for returning said common actuator to said inoperative position for reloading said spring means upon performing of the selected operation; locking means for stopping the operation of said operative means and causing the return of said common actuator whereby blocking further operations of said operative means in the case when two keys are simultaneously depressed, said common actuator engaging

said two selected intermediate members but being moved by said spring means at a speed substantially reduced with respect to said predetermined speed and unblocking means responsive to the reduced speed of said common actuator for returning said common actuator to said inoperative position, in the place of said reloading means whereby enabling the further performing of operations by said operating means.

4,128,383

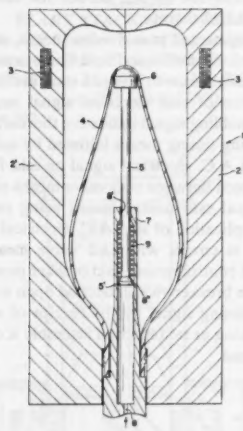
APPARATUS FOR CONTROLLING PLASTIC MATERIAL DISTRIBUTION IN MANUFACTURE OF BIAXIALLY ORIENTED PLASTIC CONTAINERS

Thomas J. Bond, Chardon; William J. Kelly, Brunswick, and Richard C. Adams, Chardon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 689,166, May 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 612,015, Sep. 10, 1975, abandoned. This application Oct. 21, 1977, Ser. No. 844,255

Int. Cl.[2] B29D *23/03*

U.S. Cl. 425—529 **3 Claims**



1. In a blow molding apparatus useful for the production of biaxially oriented hollow thermoplastic containers from thermoplastic preforms, said apparatus being composed of a hollow mold and means for positioning said thermoplastic preform within the cavity of said mold and means for preheating said preform to the orientation temperature and means for stretching and expanding said preform against the walls of the mold cavity, the improvements comprising a stretch-blow mandrel which has an axis and movable blow pin with tip, said blow pin having means responsive to fluid pressure to cause it to move axially to stretch the parison and spring means for controlling the rate of axial movement of the blow pin and for limiting the axial movement of the blow pin so that the blow pin tip cannot force the walls of said preform against the wall of the cavity of the mold, means for controlling the rate of fluid flow through the orifices, said blow pin tip being of an insulating material which reduces the heat loss from the thermoplastic preform to the blow pin tip, mold heating means for preventing the thermoplastic preform material from dropping below orientation temperatures in the last areas to expand into the mold cavity.

4,128,384

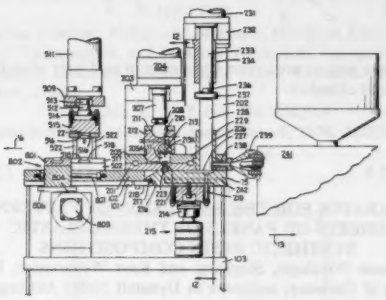
MOLDING APPARATUS EMPLOYING STICK MOLDS

Pierce E. Albright, Muncie, Ind., assignor to Automated Machinery Corporation, Muncie, Ind.

Division of Ser. No. 470,039, May 15, 1974, Pat. No. 3,986,804, which is a continuation of Ser. No. 279,490, Aug. 10, 1972, abandoned. This application Jul. 1, 1976, Ser. No. 701,557

Int. Cl.[2] B29F *1/08*

U.S. Cl. 425—548 **27 Claims**



1. Product molding apparatus for sequentially moving a plurality of molds along a predetermined path, through a plurality of stations, said product molding apparatus comprising:

mold holding means positioned at one of said plurality of stations for locating a mold during introduction to the mold of a material to be molded;

transfer means positioned along said path and cooperating with said holding means for moving molds arranged along said path serially into and away from said holding means;

mold support means disposed along said path, said transfer means cooperating with said support means for movement, in a loop, of molds arranged along said path;

mold closing means, pre-heating means, curing means, and mold opening means disposed along said loop;

said pre-heating means being disposed between said closing means and said holding means, and said curing means being disposed between said holding means and said opening means; and

said mold closing means, and said mold opening means including retainer means for retaining one section of a mold therein, and separating means for engaging another section of said mold therein, said separating means being movable transverse to the direction of said loop to separate said another section from said one section and to return said another section to said one section.

4,128,385

INJECTION MOLDING APPARATUS

David O. Allen, Wilmington, Ohio, assignor to Buckeye Molding Company, New Vienna, Ohio

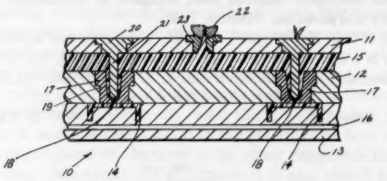
Division of Ser. No. 644,832, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 483,086, Jun. 26, 1974, abandoned. This application Jan. 28, 1976, Ser. No. 653,105

Int. Cl.[2] B29F *1/03*

U.S. Cl. 425—549 **2 Claims**

1. In a molding apparatus of the type wherein resin in a molten state is injected from a sprue passageway and through a gate to fill a mold chamber, said gate having interior wall means defining a gate opening, said apparatus including means for maintaining molten the plastic remaining in said sprue passageway immediately adjacent said gate, the improvements wherein said interior wall means define a gate opening having

a periphery exceeding the periphery of a circular opening of the same area, and including cooling means for extracting heat



from said gate to cool resin remaining in said gate after filling said mold chamber.

4,128,386

APPARATUS FOR THE EXTRUSION OF PATTERNED SHEETS OR PANELS OF THERMOPLASTIC SYNTHETIC RESIN COMPOSITIONS

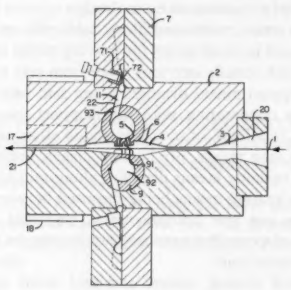
Waldemar Wissinger, Siegburg, and Kurt Webermeier, Bonn, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Aug. 4, 1976, Ser. No. 711,564

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1975, 2534724

Int. Cl.[2] B29F *3/12*

U.S. Cl. 425—462 **15 Claims**



1. An apparatus for the extrusion of patterned sheets or panels of a basic color thermoplastic resin composition having at least one additional colored thermoplastic resin composition therein, comprising:

(a) a long-slot extruder head for extruding the patterned sheets or panels, said extruder head having inlet means for introducing said basic color thermoplastic resin composition to the extruder head, said extruder head having an initial flow zone therein, said initial flow zone being downstream, in the direction of flow of the basic color thermoplastic resin composition through the extruder head, from said inlet means for introducing said basic color composition to the extruder head,

(b) means for adding at least one additional color thermoplastic resin composition to said basic color composition, said means being positioned to feed directly into said initial flow zone and comprising at least one feed channel, said at least one feed channel being constructed on a support that is insertable in the walls of the long-slot extruder head and is exchangeable, and

(c) a long-slot extrusion die in flow communication with said at least one feed channel for feeding said at least one additional colored thermoplastic resin composition to said at least one feed channel.

4,128,387

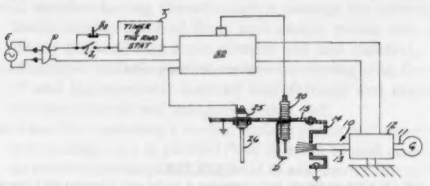
IGNITION DEVICE

Billy R. Rayburn, Rossmore, and Alfred F. Hayes, Anaheim, both of Calif., assignors to Paul T. Mu, Monterey Park, Calif., a part interest

Filed Oct. 22, 1976, Ser. No. 735,027

Int. Cl.[2] F23N *5/20*

U.S. Cl. 431—78 **8 Claims**



1. An ignition assembly connected for excitation by a source of A.C. electrical signal and adapted to ignite the fuel emitted by a burner, comprising:

a high voltage spark circuit disposed to extend into said burner for igniting said fuel upon receipt of a logical combination of a first and second enabling signal;

a flame sensor disposed in said burner for producing said first enabling signal in response to the absence of a flame thereat;

valve means connected to said burner for controlling the supply of said fuel thereto;

control means connected to said valve means, said source of A.C. electrical excitation and said flame sensor for energizing said valve means to an open state in response to the first application of said electrical signal and producing said second enabling signal indicative thereof, said control means including timing means initiated by said first application of said A.C. electrical signal or said first enabling signal interposed between said valve means and said A.C. electrical signal said timing means being reset on each successive application of said A.C. electrical signal; and

breaker means in circuit with said valve means and connected to said control means, said breaker means including a two position breaker switch latched open at the completion of said timing signal by the receipt of said enabling signal for as long as said ignition assembly is connected to said A.C. signal.

4,128,388

GEYSERIC BURNER ASSEMBLY AND METHOD FOR COMBUSTING FUELS

Benjamin H. Freze, Garden Grove, Calif., assignor to Challenge-Cook Bros., Inc., Industry, Calif.

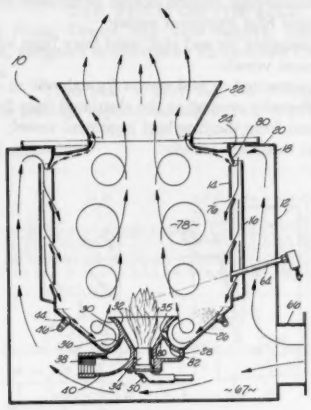
Filed May 12, 1977, Ser. No. 796,163

Int. Cl.[2] F23D *15/00*

U.S. Cl. 431—116 **14 Claims**

1. A burner assembly comprising a housing having a discharge opening in the upper end thereof and a sloped lower surface therein, a pilot nozzle disposed in said housing, a mixing ring disposed about said pilot nozzle and having an annular concave outer mixing surface extending upwardly from said sloped lower surface, means disposed within said housing for directing air to said outer mixing surface of said mixing ring and means disposed within said housing for directing fuel to

said outer mixing surface of said mixing ring, said air and fuel being caused to mix and roll upwardly within said housing by



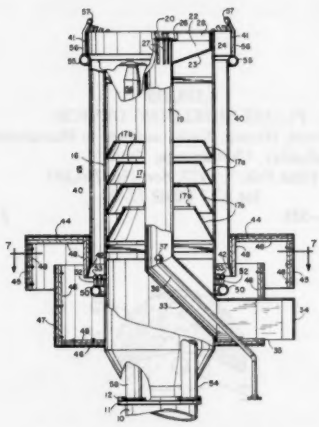
said mixing surface and upon ignition, to flow from said housing through said discharge opening therein.

4,128,389

FLARE STACK GAS BURNER

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Aug. 22, 1977, Ser. No. 826,932
Int. Cl.[2] F23D *13/20*
U.S. Cl. 431—202 **11 Claims**



1. A flare stack gas burner for waste combustible gas comprising

a tubular stack pipe communicating with a source of combustible gas and to which combustible gas is supplied for combustion at its delivery end,

an air supply pipe in communication with a source of air in said stack pipe and closed at its end,

a plurality of hollow fixed vanes extending outwardly from said air-supply pipe and to the interiors of which air from said air supply pipe is delivered,

a plurality of elongated flat nozzles for air delivery, at least one for each vane, through which said air from said vanes is delivered,

each of said nozzles being inclined with respect to its vane and contacting combustible gas from the stack pipe between said vanes and on each side of the air streams discharged from said nozzles, and

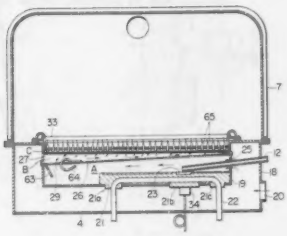
means surrounding the end of said stack for supplying additional air to the end of the tubular stack pipe and a steam pipe within said air supply pipe discharging steam for inducing air flow for combustion.

4,128,390

FUEL VAPORIZER AND BURNER UNIT FOR SPACE HEATER

Masataka Yoshino; Nobuyoshi Matsuno; Hiroyasu Kuwazawa, all of Nakatsugawa, and Tomatsu Nomaguchi, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 803,913
Claims priority, application Japan, Jun. 9, 1976, 51-67435
Int. Cl.[2] F23D *11/44*
U.S. Cl. 431—242 **8 Claims**



1. A vaporizer and burner unit for a liquid fuel space heater, comprising:

(a) lower, intermediate, and upper elongated fuel mixture flow chambers vertically disposed one above the other, said chambers being of substantially equal lengths,

(b) a preheated vaporizing block mounted at one end of the lower chamber,

(c) fuel delivery means disposed proximate the upper surface of the block,

(d) primary combustion air inlet means disposed proximate the upper surface of the block,

(e) an opening at the other end of the lower chamber communicating same with the intermediate chamber thereabove, whereby the fuel mixture flow direction is substantially reversed between the lower and intermediate chambers,

(f) a perforated plate defining the entire upper surface of the intermediate chamber for delivering a fuel mixture therefrom into the upper chamber thereabove at a uniform pressure,

(g) a burner plate defining the entire upper surface of the upper chamber and having a plurality of spaced flame apertures therein for delivering the fuel mixture therefrom into a combustion chamber thereabove, and

(h) a plurality of blow holes defined above and along both sides of the burner plate for supplying secondary combustion air to the combustion chamber.

4,128,391

GAS REGULATOR AND GAS-FIRED TORCH ASSEMBLIES

Lee G. Braunstein, 318 Clwyd Rd., Bala Cynwyd, Pa. 19004

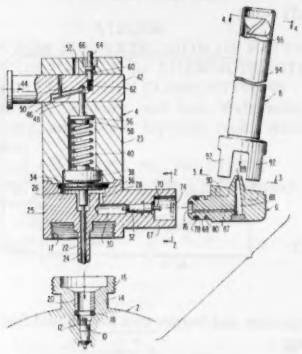
Filed Feb. 14, 1977, Ser. No. 768,464
Int. Cl.[2] F23D *13/40*
U.S. Cl. 431—354 **16 Claims**

1. A gas-fired torch assembly for welding, brazing and the like, comprising a burner tip for receiving and burning a combustible gas, and a flow path for carrying combustible pressurized gas to said burner tip,

a manually adjustable control device located in the flow path and comprising:

a control valve biased toward a closed position and being movable through intermediate positions to an open position to vary the flow of fluid moving in said flow path,

valve operating means for moving the control valve through said intermediate positions and to said open position, said valve operating means including a manually operable slide member, means for supporting said slide member for linear movement along an axis which is transverse to the direction of control valve movement, said slide member having a cam surface which is inclined with respect to said axis, and a follower means engaged with said cam surface, means supporting said follower means for movement substantially parallel to the direction of control valve movement, said follower means being in sliding contact



with said cam surface, and regulator means for operatively connecting said control valve to said follower means to change the position of the control valve in response to movement of said slide member, said regulator means being constructed as follows:

a chamber in communication with the flow path, a diaphragm having one face exposed to the chamber, a pressure spring means applying mechanical force to the other face of the diaphragm, said mechanical force being directed toward said chamber to oppose forces imposed on the diaphragm by fluid pressure in said chamber, said pressure spring having its end remote from said diaphragm connected to said follower means, and actuating rod means supported on said diaphragm and operable on said control valve, said control valve being located between said source and said chamber.

4,128,392

CALCINER FOR FINE LIMESTONE

Wilfred H. Tock, Emmaus, Pa., assignor to Fuller Company, Catasauqua, Pa.

Division of Ser. No. 603,638, Aug. 11, 1975. This application Feb. 28, 1977, Ser. No. 772,413

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—58 **5 Claims**

1. Apparatus for heat treating solid particulate material for producing a treated product comprising:

a first heat treatment vessel;

means for supplying raw material to be treated to said first heat treatment vessel;

means for supplying air to said first heat treatment vessel;

means for supplying fuel to said first heat treatment vessel for combustion therein for heat treating solid particulate material in the first heat treatment vessel;

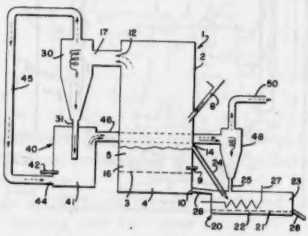
said means for supplying raw material to said first heat treatment vessel defining means for retaining coarse particles in said first heat treatment vessel for a period of time sufficient to heat treat the coarse particles;

means for discharging treated coarse particulate material from said first heat treatment vessel;

means for exhausting air and elutriated fines from said first heat treatment vessel;

means flow connected to said means for exhausting air and elutriated fines for separating the elutriated fines from the air exhausted from the first heat treatment vessel;

a second heat treatment vessel;



means for supplying air to said second heat treatment vessel;

means flow connecting the means for separating and the second heat treatment vessel for supplying the separated elutriated fines from said means for separating to said second heat treatment vessel;

means for supplying fuel to said second heat treatment vessel for combustion therein for heat treating the elutriated fines therein; and

means for discharging treated elutriated fines from said second heat treatment vessel.

4,128,393

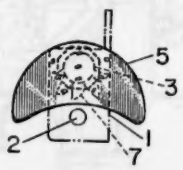
FLAME SHIELDING DEVICE

Jackson B. Sneed, Hixson, Tenn., assignor to Humphreys, Hutcheson & Moseley, Chattanooga, Tenn.

Filed Feb. 7, 1977, Ser. No. 766,191

Int. Cl.[2] F23D *15/00*

U.S. Cl. 431—351 **2 Claims**



1. A device adapted to be attached to a fuel burning instrument for shielding the flame generated by said instrument from air gusts, said device comprising:

shielding means mountable on said instrument for shielding said flame from air gusts and including means forming a concave wall adapted to enclose the space surrounding said flame at the back, to the sides, and above the flame; and

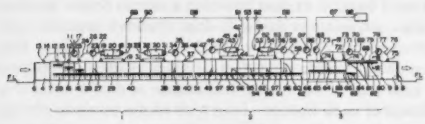
means associated with said shielding means for permitting controlled passage of air there through comprising a plurality of apertures in said shielding means the longitudinal axes of which are in various orientations with respect to one another, whereby the flow of air through said shielding means is diffused to substantially avoid direct impingement of air upon said flame.

4,128,394

TUNNEL KILN FOR USE IN REBAKING CARBONACEOUS MOLDINGS IMPREGNATED WITH TAR, PITCH OR THE LIKE

Kiyoshi Naito, Urawa, and Akio Sukuya, Kawagoe, both of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1977, Ser. No. 773,654
Claims priority, application Japan, Feb. 8, 1977, 52-12118
Int. Cl.[2] F27B 9/26
U.S. Cl. 432—137 5 Claims



1. A tunnel kiln for use in rebaking carbonaceous moldings impregnated with tar, pitch or the like, said tunnel kiln including a preheating zone, a baking zone and a cooling zone; arch shafts provided in the kiln ceiling, heating gas blow-in holes at the lower portion of the kiln side wall, a plurality of gas recirculating devices for feeding gas from the arch shafts in said preheating zone and baking zone to said blow-in holes, a plurality of connected cars movably mounted in said kiln, each car including passage means serving both as heating gas passages and combustion chambers; a muffle mounted on each car for accommodating said moldings to be rebaked, said muffle being disposed above said passage means, said muffle comprising a bottom plate, a tar-receiving plate mounted in said bottom plate, a holder mounted in said tar-receiving plate for supporting the moldings to be rebaked, a cover supported on said bottom plate to thereby enclose said moldings, holder and tar-receiving plate, a seal disposed between said cover and said bottom plate, and a plurality of tar gas discharge openings provided in the upper surface of said cover.

4,128,395

TRANSFER PRINTING WITH CARBOXYLIC DYES

Harry R. Hadfield; Harry H. Sumner, and Gerald Williams, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 10, 1973, Ser. No. 423,402

Claims priority, application United Kingdom, Dec. 15, 1972, 57969/72

Int. Cl.[2] D06P *5/00*

U.S. Cl. 8—2.5 A 2 Claims

1. A process for the transfer colour printing of synthetic polyamide textile materials, which comprises placing a transfer material which carries a coloured pattern derived from one or more disperse dyestuffs each of which contains one carboxylic acid group in contact with the synthetic textile material and heating the transfer material and the synthetic textile material in a zone which is maintained at a pressure less than atmospheric pressure whilst they are in contact so as to transfer the dyestuff from the transfer material to the synthetic textile material.

4,128,396

PROCESS FOR THE IMPROVEMENT OF DYEING PROPERTIES OF PIGMENTS OF THE ANILINO AND ARYLMERCAPTO ANTHRAQUINONE SERIES

Arnold Wick, Therwil, and Max Jost, Oberwill, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 698,624, Jun. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 509,877, Sep. 27, 1974, Pat. No. 3,975,410. This application Sep. 28, 1977, Ser. No. 837,497

Claims priority, application Switzerland, Oct. 10, 1973, 14393/73

Int. Cl.[2] C09B *1/00;* C07C *49/68*

U.S. Cl. 8—39 C 3 Claims

1. In the process of bulk dyeing linear polyesters with a pigment of the anthraquinone series, the improvement comprising using as a pigment, an arylmercapto anthraquinone obtained by halogenation, using chlorinating or brominating agents, of 1,8-diphenylmercapto anthraquinone.

4,128,397

SULFUR DIOXIDE LIBERATION COMPOSITIONS AND METHODS OF USING SAME

David J. Lynch, Copthorne Bank, England, assignor to Rentokil Limited, East Grinstead, England

Filed Oct. 31, 1975, Ser. No. 627,666

Claims priority, application United Kingdom, Oct. 31, 1974, 47242/74

Int. Cl.[2] A61L *13/00;* A01N *11/00*

U.S. Cl. 422—29 21 Claims

1. A sterilizing composition capable fof giving extended release of sulphur dioxide in the presence of moisture, consisting essentially of:

(a) a compound that will liberate sulphur dioxide in contact with water; and

a water-soluble thiosulphate which acts as a moderator for the release of said sulphur dioxide said components a and b being present in amounts such that it is possible to produce sulphur dioxide from the composition sufficiently slowly that the composition is not rapidly exhausted but continues to liberate sulphur dioxide for a prolonged period of time.

4,128,398

PROCESSING AID FOR USE IN WORSTED AND WOOLEN PROCESSES

Mel Alpert, Morristown, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation of Ser. No. 451,909, Mar. 18, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,289

Int. Cl.[2] D06M *13/20, 13/34;* D06C *7/04*

U.S. Cl. 8—127.6 32 Claims

1. In a process for producing worsted from wool stock including the steps of rinsing the stock and dyeing tops, the improvement comprising pretreating the tops in a bath having a pH of about 6 prior to dyeing with a processing aid in an amount sufficient to preserve fiber strength and softness selected from the group consisting of

(1) polyamide
(2) epoxidized polyamide
(3) chain extended polyamide
(4) epoxidized chain extended polyamide
(5) epoxidized polyamine
(6) epoxidized polyalkylenimine
(7) polyacrylamide
(8) polyacrylic acid
(9) aminoplast resin
(10) oligomer of urea, polyamine and alkylene dihalide, and
(11) reaction product of acrylamide, diallyldimethyl ammonium chloride and glyoxal

wherein the polyamide is chain extended with a chain extender selected from the group consisting of alkyldihalide, alkyletherdihalide, phenyl bis-(alkylhalide), and phenylalkyldihalide having from one to twelve carbon atoms.

4,128,399

DEVICE AND METHOD FOR DETECTING PHENOTHIAZINE-TYPE DRUGS IN URINE

Lance A. Liotta, 6186 Wilson Mills Rd., Mayfield Village, Ohio 44143, and Robert S. Weiss, 18316 Newell, Shaker Heights, Ohio 44122

Filed Mar. 15, 1976, Ser. No. 667,038

Int. Cl.[2] G01N *31/06*

U.S. Cl. 23—230 B 28 Claims

1. A device for determining the presence of a phenothiazine-type drug in urine comprising a substrate supporting a mass of cation exchange resin impregnated with a color forming reagent, said ion-exchange resin being present in an amount sufficient to liberate adequate hydrogen ions to cause the solution being tested in the area in immediate contact with said ion-exchange resin to have a pH sufficient to cause said color forming reagent to react with said phenothiazine-type drug, and said color forming reagent being present in an amount sufficient to cause a color change to occur in said device when brought into contact with a urine specimen containing a phenothiazine-type drug.

4,128,400

READ-OFF DEVICE FOR MEDICAL SAMPLES

Franz Mühlböck, Munich; Akos Karpáty, Otterfing, Obby, and Wilhelm Pross, Munich, all of Germany, assignors to Compur-Electronic Gesellschaft mit beschränkter Haftung, Munich, Germany

Filed Dec. 15, 1976, Ser. No. 750,769

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556915

Int. Cl.[2] G01N *33/16*

U.S. Cl. 422—101 8 Claims

1. A centrifuge device for centrifuging medical samples to separate the samples into visually distinct components and for measuring the proportions of such components without removing the centrifuged samples from the centrifuge, said centrifuge device comprising

(a) a centrifuge rotor rotatable about an axis,

(b) means for clamping on said rotor a plurality of tubular containers each open at both ends and each adapted to be

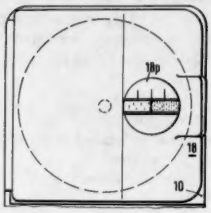
completely filled with a sample to be tested, and each arranged radially with respect to said axis,

(c) each of said containers being of the same length and each being clamped, during rotation of said rotor, in a definite predetermined location on said rotor,

(d) a reading scale marked on said rotor alongside the clamped location of each of said containers,

(e) each reading scale being graduated in percentage graduations from 0 to 100,

(f) the zero graduation of each scale being precisely at one



end of its associated container and the 100 graduation of the scale being precisely at the opposite end of its associated container when the container is in clamped position on the rotor,

(g) a housing surrounding said rotor and said containers thereon, and

(h) optical magnifying means connected to said housing to facilitate reading the point along said scale associated with one of said containers at which a junction line between two components of the contents of said one of said containers is observed.

4,128,401

CELLULAR SOLVENT REFINED COAL AND METHODS FOR MAKING SAME

Justin C. Powell, and Matthew A. McMahon, both of Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 4, 1977, Ser. No. 793,703
Int. Cl.[2] C10L *9/08*
U.S. Cl. 44—1 R **10 Claims**

1. A cellular form of solvent refined coal having a plurality of cells, an apparent density less than 1g/cc and a void volume of 5 to 99%, said form consisting of a continuous, syntactic foamed carbonaceous mass produced by heating and foaming said solvent refined coal.

4. A method for making cellular solvent refined coal of apparent density less than 1 and a void volume of 5 to 99% comprising providing a solvent refined coal having a melting point in the range of 100° to 250° C.; heating said coal above said melting point to form a plastic mass and further reacting said mass under cell-forming conditions to form a plurality of cells therein.

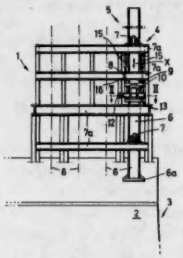
4,128,402

APPARATUS FOR COMPACTING COAL

Kurt Leibrock; Adolf Bier, both of Volklingen, and Friedrich Büch, Walpershofen, all of Fed. Rep. of Germany, assignors to Saarbergwerke Aktiengesellschaft, Saarbrueken, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,617
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618327
The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.
Int. Cl.[2] B30B *11/00*; C10L *5/22*
U.S. Cl. 44—11 **20 Claims**

1. In an apparatus for compacting coal in a pounding box to convert the coal into a cake usable in coke ovens by repeatedly lifting and dropping onto the coal at least one vertically displaceable punner composed of an upright and a foot at a lower end of the same, a combination comprising engaging means for frictionally engaging said upright; mounting means mounting said engaging means for displacement in a path between a lower position in which it engages and entrains said upright



and an upper position in which it releases said upright and permits the punner to gravitationally descend onto the coal; and drive means for moving said engaging means between said positions thereof.

4,128,403

FUEL ADDITIVE FOR DISTILLATE FUELS

Lewis R. Honnen, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 503,984, Sep. 6, 1974, abandoned. This application Jun. 29, 1976, Ser. No. 700,936
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—71 **16 Claims**

1. A fuel additive comprising from 40 to 90 weight percent of an inert hydrocarbon solvent, from 5 to 50 weight percent of a hydrocarbyl amine having at least one hydrocarbyl group having a molecular weight between 300 and 5000, and 0.1 to 10 weight percent of a hydrocarbyl succinic acid or anhydride having from 12 to 30 carbons, and from 0.1 to 10 weight percent of a demulsifier.

9. A gasoline composition containing (1) a major portion of a gasoline fuel fraction, (2) from 50 to 800 ppm of a hydrocarbyl amine having at least 1 hydrocarbyl group with a molecular weight between 300 and 5000, (3) 0.5 to 20 ppm of a hydrocarbyl succinic acid or anhydride having from 12 to 30 carbons, and (4) from 2 to 10 ppm of a demulsifier.

4,128,404

METHOD FOR SEPARATING LIGHT-WEIGHT COMPRESSIBLE MATERIAL

Dimitri S. Stamatiou, and Lila D. Stamatiou, both of Kansas City, Mo., assignors to Pneumatic Force Feeder, Inc., Kansas City, Mo.

Division of Ser. No. 677,504, Apr. 15, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,480
Int. Cl.[2] B01D *45/12*
U.S. Cl. 55—1 **2 Claims**

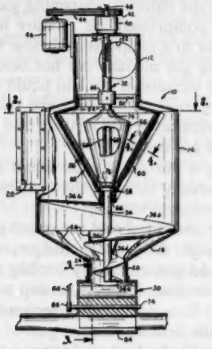
1. A method of recovering fiberglass trimmings from a fiberglass bats manufacturing process, said method comprising the steps of:

(a) Collecting said trimmings,

(b) Fracturing said trimmings to provide glass fibers of a substantially uniform size,

(c) Air blowing said fibers over a minor distance to a separation device comprising a compaction means,

(d) Removing air from said fibers and compacting said fibers in said device sufficient to form agglomerated particles,



(e) Air conveying said agglomerated particles over a major distance to said process for reuse therein.

4,128,405

INCOMPLETE DRYING OF ACTIVATED CARBON IN A PROCESS FOR VCM REDUCTION IN VAPORS

Richard A. Frohreich, Norman, and John F. Scamehorn, Ponca City, both of Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 16, 1977, Ser. No. 769,361
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—59 **7 Claims**

1. In a process for removing ethylenically unsaturated monomer halides from an effluent stream containing the same bypassing the stream through particulate activated carbon to adsorb the monomeric halides on the activated carbon under essentially adiabatic conditions, the improvement therein of increasing the adsorption capability of the activated carbon which comprises, prior to passing the stream through the activated carbon, rendering the activated carbon to a state of incomplete dryness wherein the average water content is from about 0.03 to about 0.16 pounds of water per pound of carbon across the carbon, such that the carbon nearest the incoming stream contains a high concentration of water and the carbon adjacent the outlet is nearly dry, said effluent stream containing sufficient unsaturated monomer halide to desorb water from the carbon at the inlet of the carbon, whereby during passage of the stream through the activated carbon the heat of adsorption of the monomeric halide desorbs water from the activated carbon, thus controlling the temperature of the activated carbon at a level favorable to increased monomeric halide adsorption without the necessity for any external cooling.

4,128,406

CONTACT APPARATUS FOR MULTIPHASE PROCESSING

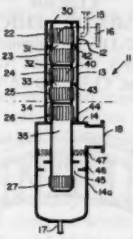
Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 655,239, Feb. 4, 1976, Pat. No. 4,062,663.
This application Sep. 28, 1977, Ser. No. 837,200
Int. Cl.[2] B01D *47/10*
U.S. Cl. 55—237 **11 Claims**

1. An apparatus for processing cocurrent flows of separable phases, comprising in combination:

(a) a housing having an input section, an output section and an intermediate section therebetween for passing said flows from said input section to said output section, having separate input means connected to said input section for feeding each of said phases thereinto, and having output means connected to said output section for discharging the processed phases therefrom,

(b) said intermediate section comprising at least one pair of first and second mixing elements in axial alignment and disposed coaxially in said housing, each of said elements having a cylindrical chamber closed at one end and open at the other end, each pair of said elements being joined together at their open ends, the walls of each of said chambers having wall openings therein for the passage of said flows therethrough, said wall openings being pro-



vided with flow guide deflectors extending from said walls for directing the said flows in the same circumferential direction into the chamber of the first mixing element and out of the chamber of the second mixing element, said deflectors extending from said walls inside of one and outside of the other of a pair of elements, and

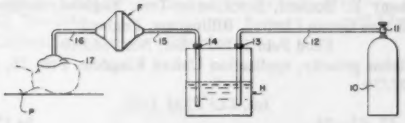
(c) a partition extending between said housing and each said pair of mixing elements intermediate the first and second mixing elements thereof for passing at least a principal part of said flows through the first and second mixing elements of each said pair in sequence.

4,128,407

STERILE OXYGEN SYSTEM AND REPLACEABLE FILTER THEREFORE

James F. Chapel, 1019 Ridgecrest Cir., Denton, Tex. 76201, assignor to James Frederick Chapel, Denton; Homer C. Harper, III, Dallas, both of, Tex. and Michael F. Coyne, San Francisco, Calif.

Filed Nov. 3, 1975, Ser. No. 627,931
Int. Cl.[2] B01D *53/00*
U.S. Cl. 55—259 **21 Claims**



1. A system for providing substantially bacteria free humidified oxygen to a respiratory system, comprising in combination:

a source of pressurized oxygen;

a humidifier including a gas inlet connected in fluid communication to said source, a reservoir of liquid, a gas-liquid outlet and means for humidifying said oxygen while passing oxygen from said inlet through said liquid and out of a gas-liquid outlet;

means connected in fluid communication to said outlet and adapted to provide oxygen to said respiratory system; and

sterile, disposable filter means connected between said last mentioned means and said means for humidifying said oxygen, said filter means being capable of removing a substantial amount of bacteria from humidified oxygen while providing a relatively small increase in back pressure to the flow of humidified oxygen due to wetting, whereby humidified, substantially bacteria free oxygen

can be supplied for life support even though the oxygen, oxygen regulating equipment, or the humidifying apparatus is not sterile; and

said filter means includes housing having an inlet and an outlet to which tubing can be detachably connected and a filter pad, located in said housing between said inlet and said outlet, containing multiple layers each of a hydrophobic support material and a hydrophobic bacteria filtering material.

4,128,408

AIR FILTER FOR MOTOR VEHICLE CARBURETOR

Walter D. Poole, 10922-117 St., Edmonton, Alberta, Canada

Filed May 9, 1977, Ser. No. 794,856

Int. Cl.[2] B01D *46/00*

U.S. Cl. 55—498 **4 Claims**

1. An air filter for a motor vehicle carburetor including a filter body comprising a pair of rings spaced apart in an axial direction by spacing means between said rings and occupying a relatively small proportion of the space between the rings, said rings having flat axially opposed surfaces, and an annular filter cloth surrounding the space between the rings and having edges overlapping the radially outer edges of the rings in a radially inward direction to engage the outer flat surfaces of the rings and retain the filter cloth in assembly with the filter body, the edges of the filter cloth being resilient to enable the filter cloth to be readily assembled with and removed from the filter body, and the filter cloth having a weave which prevents passage of undesirable solid matter therethrough without unduly restricting air flow.

4,128,409

CHLORINE RECOVERY PROCESS

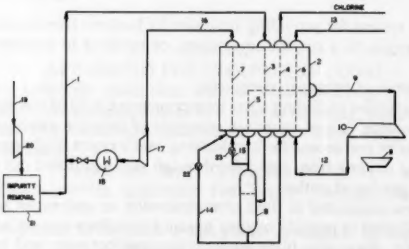
Anthony E. Bennett, Stockton-on-Tees, England, assignor to Tioxide Group Limited, Billingham, England

Filed Feb. 8, 1977, Ser. No. 766,810

Claims priority, application United Kingdom, Feb. 25, 1976, 07327/76

Int. Cl.[2] F25J *3/02*

U.S. Cl. 62—26 **14 Claims**



1. Process for the recovery of chlorine from chlorine-containing gases comprising the following steps:

(a) removing from the chlorine-containing gas mixture, either before or after step (b) below gases which, if present in the gas mixture in substantial quantity, would form solids or would liquify with chlorine in the subsequent process steps;

(b) compressing the chlorine-containing gas mixture;

(c) cooling the compressed gas mixture in a multi-stream heat exchanger to a temperature below the dew-point of chlorine in the gas mixture but not below −101° C. to form a cooled mixture of gas and liquid chlorine;

(d) withdrawing said cooled mixture from the heat exchanger and separating said mixture into a liquid chlorine fraction and a gas fraction;

(e) recirculating a portion of said liquid chlorine fraction from (d) separately through the heat exchanger and recovering therefrom chlorine;

(f) circulating a portion of said separated gas fraction from step (d) through the heat exchanger, withdrawing the resulting heated gas, externally cooling the gas to a temperature below that obtained in step (c) above but not below −101° C. and thereafter recirculating the cooled gas through the heat exchanger;

(g) passing through the heat exchanger a mixture of predetermined composition of said gas and liquid chlorine fractions from step (d) above, withdrawing the resulting heated gas mixture from the heat exchanger, compressing the heated mixture and returning the compressed mixture to the gas/liquid phase separator of step (d) via the multi-stream heat exchanger.

4,128,410

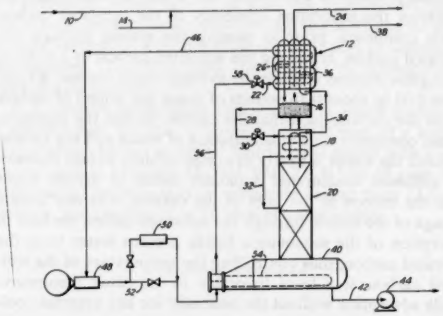
NATURAL GAS TREATMENT

Kenneth H. Bacon, Tulsa, Okla., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 612,158, Sep. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 445,451, Feb. 25, 1974, abandoned. This application Mar. 16, 1977, Ser. No. 778,015

Int. Cl.[2] F25J *1/02*

U.S. Cl. 62—40 **13 Claims**



1. Apparatus for treating a stream of natural gas at a high pressure exceeding about 100 psi to remove ethane and higher boiling point hydrocarbons to produce a pipeline gas at a pressure substantially equal to the pressure of the natural gas stream without compressing the pipeline gas comprising a heat exchanger having at the upper end thereof an inlet for the natural gas and an outlet for the pipeline gas, a separator below said heat exchanger adapted to separate pipeline gas from ethane and higher boiling point hydrocarbons condensed in the heat exchanger from the natural gas, an open passageway for the natural gas from the inlet vertically through the heat exchanger and from the lower end of the heat exchanger into the separator, partition means positioned in the heat exchanger between the inlet for the natural gas and the outlet for the pipeline gas to divide the open passageway in the heat exchanger into a natural gas and condensed liquid section from

the inlet of the heat exchanger downwardly to the separator and a pipeline gas section from the separator upwardly through the heat exchanger to the outlet for the pipeline gas, a closed cycle external refrigeration system adapted to produce a single cold refrigerant at a temperature suitable for condensing ethane and higher boiling point hydrocarbons from the natural gas, and means to circulate the cold refrigerant in the closed cycle external refrigeration system into and through the heat exchanger in a series of horizontal passes proceeding from the lower end to the upper end of the heat exchanger in countercurrent transverse indirect heat exchange with the natural gas and in concurrent transverse indirect heat exchange with the pipeline gas, the refrigerant flow being subdivided in each of the passes and terminating in a header after each pass with mixing in the header of the subdivided refrigerant after each pass and delivering the refrigerant from the header to the next pass to transfer heat from the natural gas to the refrigerant and from the refrigerant to the pipeline gas and thereby condense ethane and higher boiling hydrocarbons in the natural gas and heat the pipeline gas to discharge said pipeline gas at the outlet at substantially the temperature of the natural gas.

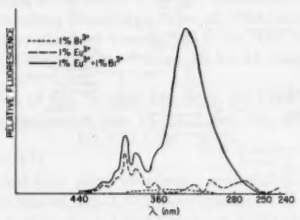
4,128,411
GLASS COMPOSITIONS HAVING FLUORESCENCE PROPERTIES

Renata Reisfeld, Jerusalem, Israel; Yona Eckstein, Reno, Nev., and Leah Boehm, Jerusalem, Israel, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 650,658, Jan. 20, 1976, abandoned. This application Jun. 15, 1977, Ser. No. 806,642

Int. Cl.[2] **C03B** *23/20, 9/00;* **B01F** *3/00;* **C03C** *3/00*

U.S. Cl. 65—18 **18 Claims**



1. A method for producing glass, capable of emitting monochromatic radiation in predetermined regions of the spectrum wherein the emitted radiation has an unexpectedly high intensity compared with radiation emitted by singly doped glass, comprising:

a. mixing an oxide glass in pellet form with:

(1) a reducing agent, and

(2) a combination of compounds selected so as to provide a dopant, donor-acceptor ion pair in predetermined relative concentrations selected from the group consisting of trivalent thulium plus trivalent cerium, trivalent bismuth plus trivalent europium, or trivalent bismuth plus trivalent samarium;

b. homogenizing the resulting mixture;

c. heating said homogenized mixture;

d. dropping a quantity of the homogenized mixture in hot melt form upon a first glazed ceramic surface of predetermined configuration supporting an element for confining said hot melt mixture;

e. pressing a second glazed ceramic disk in contact with said element and said hot melt glass matrix; and

f. cooling said glass matrix and removing said glass matrix from said ceramic disks and said confining element.

4,128,412
HERBICIDAL COMPOSITION AND METHOD USING N-(2-ETHYLSULFONYL-1,3,4-THIADIAZOL-5-YL)-N-METHYL-N'-METHYL UREA

Carl Metzger, Wuppertal-Elberfeld; Ludwig Eue, and Helmuth Hack, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 579,124, May 19, 1975, Pat. No. 4,049,670, which is a division of Ser. No. 247,176, Apr. 24, 1972, which is a continuation of Ser. No. 887,368, Dec. 22, 1969, abandoned. This application Aug. 1, 1977, Ser. No. 821,031

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1968, 1816568

Int. Cl.[2] **A01N** *9/14, 21/02*

U.S. Cl. 71—90 **2 Claims**

1. Method of combating undesired vegetation which method comprises applying to common weeds and crops and their habitat herbicidally effective amounts of N-(2-ethylsulfonyl-1,3,4-thiadiazol-5-yl)-N-methyl-N'-methyl urea.

2. A composition for combatting undesired vegetation which comprises an herbicidally acceptable carrier and in amount effective to kill common weeds and/or crops, N-(2-ethylsulfonyl-1,3,4-thiadiazol-5-yl)-N-methyl-N'-methyl urea.

4,128,413
CARBANILIC ACID ESTERS AND HERBICIDAL COMPOSITION CONTAINING SAME

Friedrich Arndt, and Gerhard Boroschewski, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

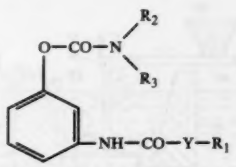
Filed Jun. 24, 1977, Ser. No. 809,935

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2630418

Int. Cl.[2] **A01N** *9/12, 9/20;* **C07C** *121/78, 154/155*

U.S. Cl. 71—100 **55 Claims**

1. Carbanilic acid ester of the formula



in which

R_1 is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms or alkinyl of 2 to 6 carbon atoms,

R_2 is cyanoalkyl of 1 to 4 carbon atoms in the alkyl group,

R_3 is phenyl which may also be substituted in one or two places by the same or different groups selected from the group of alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 5 carbon atoms, alkylthio of 1 to 3 carbon atoms, halogen and trifluoromethyl, and

Y is oxygen or sulfur.

52. A herbicidal composition comprising about 10 to 80% by weight of at least one active agent according to claim 1, and about 90 to 20% by weight of a liquid or solid carrier material.

4,128,414
METHOD OF INTRODUCING ALUMINUM WIRE INTO STEEL MELTS AND APPARATUS FOR PRACTICING SAID METHOD

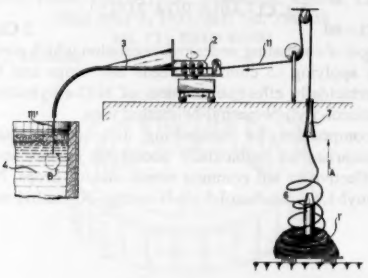
Martin Hater; Wolfgang Pluschkell, and Heinrich Wisnewski, all of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,438

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554860

Int. Cl.[2] C21C *7/00*

U.S. Cl. 75—58 1 Claim



1. A method of introducing aluminium wire into a steel melt in a fully continuous operation, which includes in combination the steps of:

withdrawing the wire overhead from a stationary wire bundle at rest, and feeding the withdrawn wire into the melt while guiding the withdrawn wire with rollers engaging wire free from play prior to its introduction with synchronous movement to assure constant feeding quality for optimum treatment effect into the melt over the entire feeding period.

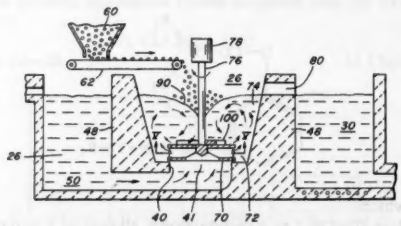
4,128,415
ALUMINUM SCRAP RECLAMATION

Jan H. L. van Linden, Allison Park, Pa.; Raymond J. Claxton, Dallas, Tex.; Joseph R. Herrick, Verona, and Robert J. Ormesher, Allegheny Township, Westmoreland County, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 9, 1977, Ser. No. 859,060

Int. Cl.[2] C22B *21/06*

U.S. Cl. 75—65 R 8 Claims



1. An improved method of melting metal scrap in a molten melting media comprising:

(a) providing a body of molten melting media in a housing for purposes of melting metal scrap therein, the housing being generally circular in cross section and having upper and lower portions;

(b) introducing a supply of scrap metal to the melting media contained in the upper portion of said housing;

(c) adding a supply of molten melting media to said body through a volute located in the lower portion of said housing, said adding being accomplished by action of an impeller mounted on a drive shaft extending through the upper portion of the housing, and rotating in the lower portion of the housing, the impeller having a substantially circular disc having blades extending substantially downwardly therefrom to a flat ring member having a circular shaped opening in the center thereof, the opening adapted to permit molten melting media to enter the impeller axially, the disc, blades and ring member cooperating to discharge the molten melting media therefrom radially at a relatively high velocity;

(d) controlling the motion of the body of molten melting media and the metal scrap in the upper portion of the housing by action of vanes mounted on said shaft to create a vortex in said body for mixing said scrap in said melting media; and

(e) removing melted scrap and molten melting media at a rate substantially commensurate with their rate of introduction to the housing, the melted scrap and molten melting media removed through an opening located in the upper portion of the housing.

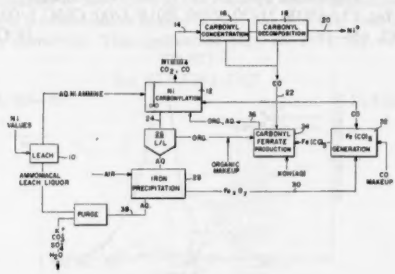
4,128,416
NICKEL RECOVERY EMPLOYING CARBONYL FERRATES

Alkis S. Rappas, Bedford, and J. Paul Pemsler, Lexington, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,054

Int. Cl.[2] C22B *23/04*

U.S. Cl. 75—119 12 Claims



1. A process for recovering nickel from an ammoniacal nickel solution comprising the steps of:

contacting the nickel solution with carbonyl ferrate ions in a carbon monoxide rich environment to produce a nickel carbonyl;

collecting the nickel carbonyl by separating a gas phase from said solution; and

decomposing the nickel carbonyl to produce nickel metal and carbon monoxide.

4,128,417
PROCEDURE FOR THE PREPARATION OF REFINED MATERIALS CONTAINING SiC AND/OR FeSi

Bernhard Lung, Wortelstrasse 2, D-7554 Kuppenheim, Fed. Rep. of Germany

Filed Aug. 19, 1977, Ser. No. 826,269

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638117

Int. Cl.[2] C22C *1/00;* C22B *1/08*

U.S. Cl. 75—129 11 Claims

1. A method for the preparation of fine grain metallurgically adjustable silicon bearers containing a material selected from the group consisting of SiC, FeSi, and mixtures thereof having a grain size under 0.2mm, said method comprising the steps of compressing, under a pressure greater than 300 bp/cm^2, a thin,

moist mix, a fraction of said mix comprising 30–80% SiC or FeSi-containing materials or mixtures thereof, with 10–15% hudraulic binding agent, the remaining silicon-containing fractions having a grain size larger than 0.2mm and hardening the compressed mix in a saturated steam atmosphere above 10 bp/cm^2 at a temperature above 100° C.

4,128,418

ENHANCED GRAIN GROWTH IN ARSENIC MODIFIED COPPER-ZINC BRASSES

John M. Vitek, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jul. 11, 1977, Ser. No. 814,195
Int. Cl.^{2} C22C *9/04*
U.S. Cl. 75—157.5 **3 Claims**

1. A brass alloy having deep drawing properties and exhibiting enhanced grain growth consisting of from about 8.0 to about 34.0 weight percent zinc, from about 0.4 to about 0.8 weight percent arsenic and the remainder copper, said alloy exhibiting a grain size of at least about 50 microns after cold rolling at least 57% and annealing at a temperature of 525° C. for 1 hour.

4,128,419

NICKEL-BASE ALLOY

Kuzma I. Terekhov, Maly Pionersky pereulok, 5 kv. 44; Alexei T. Tumanov, Gruzinskaya ulitsa, 36, kv. 58; Alexandra P. Ozerova, Yartsevskaya ulitsa, 32/30, kv. 22, all of Moscow; Valentin V. Topilin, ulitsa Mira, 6, kv. 29, Elektrostal; Mikhail Y. Dzugutov, ulitsa Mira, 4, kv. 37, Elektrostal; Mara A. Ljubinskaya, ulitsa Mira, 4, kv. 60, Elektrostal; Gennady A. Pashchnik, ulitsa Sovetskaya, 9, kv. 22, Elektrostal; Alexandr S. Nikishov, ploschad Vosstaniya, 1, kv. 410, Moscow, and Terenty I. Ustinov, ulitsa S. Lazo, 15, kv. 21, Kuibyshev, all of U.S.S.R.

Continuation of Ser. No. 341,176, Mar. 14, 1973, abandoned.
This application Jun. 14, 1977, Ser. No. 806,505
Int. Cl.^{2} C22C *19/05*
U.S. Cl. 75—171 **2 Claims**

1. A nickel-base alloy consisting essentially of in wt.%: 13–15 of chromium, 2.8–3.5 of molybdenum, 1.4–1.9 of aluminum, 2.3–3.0 of titanium. 1.8–2.4 niobium, 0.001–0.05 of boron, 0.001–0.005 of cerium, 0.001–0.01 of lanthanum, 0.001–0.1 of magnesium, no more than 0.08 of carbon, 0.5–2.0 of iron, the rest being nickel.

4,128,420

HIGH-STRENGTH IRON-MOLYBDENUM-NICKEL-PHOSPHORUS CONTAINING SINTERED ALLOY

Friedrich J. Esper, Leonberg, and Robert Zeller, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 17, 1977, Ser. No. 778,679
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613255
Int. Cl.^{2} C22C *33/02, 38/08, 38/12*
U.S. Cl. 75—230 **4 Claims**

1. A high strength sintered alloy consisting essentially of between about (i) 2% and 4.5% by weight molybdenum, (ii) more than 2.5% and less than 3.5% nickel, (iii) more than 0.3% and less than 0.6% phosphorus, and the balance iron, and having a tensile strength $\sigma_B \geqq 600$ N/mm^2; ratio of yield to tensile strength $\sigma_S/\sigma_B \geqq 0.65$; elongation at rupture $\delta \geqq 7\%$; and toughness $a_b \geqq 50$ Joule/cm^2.

4,128,421

TANTALUM POWDER FOR PRODUCING AN EMBRITTLEMENT-RESISTANT WIRE

Harold G. Marsh, 1417 Bull Creek Dr., Libertyville, Ill., 60048 and James A. Pierret, 4408 Girard Ave., Muskogee, Okla. 74401

Division of Ser. No. 345,956, Mar. 29, 1973, Pat. No. 4,062,679.
This application Oct. 17, 1977, Ser. No. 842,587
Int. Cl.^{2} B22F *1/00*
U.S. Cl. 75—251 **2 Claims**

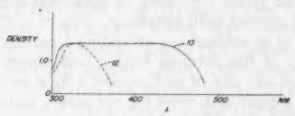
1. A powder composition suitable for the preparation of an embrittlement-resistant tantalum wrought product composed of substantially pure tantalum containing less than 300 parts per million of columbium, less than 50 parts per million of tungsten, less than 10 parts per million of molybdenum, less than 30 parts per million of chromium, less than 20 parts per million of calcium, and less than 200 parts per million of iron, chromium and nickel combined, said powder composition containing from about 100 to about 2000 parts per million of silicon on an overall basis and comprising individual particles substantially free of silicon and other individual particles containing from about 1% to about 5% of silicon by weight.

4,128,422

CYCLOPROPENONE VESICULAR IMAGING COMPOSITION, ELEMENT AND PROCESS

George L. Fletcher, Pittsford; Donald H. Wadsworth, and Jean E. Jones, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,774
Int. Cl.^{2} G03C *5/24, 1/68, 1/00*
U.S. Cl. 96—48 HD **15 Claims**



1. In a vesicular imaging composition comprising: (I) a polymeric binder having sufficient gas impermeability as to provide a latent image stability period for CO that is substantially greater than about one minute when ascertained for an element having a dried binder thickness of between about 10 and about 15 microns; and (II) admixed with said binder, a radiation-decomposable vesiculating agent capable of generating a gas upon imagewise exposure;

the improvement wherein the vesiculating agent is a cyclopropenone having a λ_{max} in ethanol no greater than about 400 nm in the spectral range of about 250 to about 650 nm.

4,128,423

DIAZOTYPE MATERIAL THAT CAN BE DEVELOPED BY APPLYING A SMALL AMOUNT OF DEVELOPING LIQUID, AND DEVELOPMENT THEREOF

Gerardus J. Vosbeek, Velden, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Continuation of Ser. No. 575,785, May 8, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,615

Claims priority, application Netherlands, May 29, 1974, 7407161

Int. Cl.[2] G03C 5/34, 1/60

U.S. Cl. 96—49 14 Claims

1. Diazotype material consisting essentially of a paper support each side of which is coated with a substantially water-impermeable sealing layer containing a hydrophobic polymeric, film-forming substance and one side of which has a light-sensitive layer coated onto its sealing layer, characterized in that the sealing layer on at least said one side is a substantially water-impermeable layer having a dry weight of 2 to 10 g/m^2 and consisting essentially of film-forming binder selected from the group consisting of polyvinyl acetate and a copolymer of styrene with butadiene, with or without finely divided filler in an amount not exceeding 1 part by weight of filler per part of binder, and said light-sensitive layer has a dry weight of at most 8 g per square meter and consists essentially of, in admixture, a light-sensitive diazonium compound, a polyvinyl alcohol having a degree of hydrolysis over 75% and starch particles, the weight ratio of polyvinyl alcohol to starch particles being 1:5–20, said light-sensitive layer after imagewise exposure to light being capable of absorbing substantially completely and being developable into a strong image by between 1:5 and $4.5cm^3/m^2$ of an aqueous solution of an azo coupling component reactive to said diazonium compound, said light-sensitive layer being adherent to the underlying sealing layer, and said material being substantially non-curling, in either dry or moist condition.

12. Process for making photocopies, in which a diazotype material is imagewise exposed and then developed by spreading over its light-sensitive side 1.5 to 4.5 cm^3 per square meter of an aqueous solution of an azo coupling component, characterized in that the diazotype material consists essentially of a paper support each side of which is coated with a substantially water-impermeable sealing layer having a dry weight of 2 to 10 g/m^2 and consisting essentially of a film-forming binder selected from the group consisting of polyvinyl acetate and a copolymer of styrene with butadiene, with or without finely divided filler in an amount not exceeding 1 part by weight of filler per part of film-forming binder, and coated upon the sealing layer at one side of said support a light-sensitive layer having a dry weight of at most 8 g per square meter and consists essentially of, in admixture, a light-sensitive diazonium compound, polyvinyl alcohol having a degree of hydrolysis of at least 75% and starch particles, the weight ratio polyvinyl alcohol to starch particles being 1:5–20, and as said solution is being spread absorbing it substantially completely in said light-sensitive layer and thus forming the latter into a strong image, said light-sensitive layer being firmly adherent to the underlying sealing layer, and said material being substantially non-curling, in either dry or moist condition.

4,128,424

METHOD FOR TREATING PHOTOGRAPHIC PROCESSING FLUIDS PRIOR TO SEWERING THEREOF

Erwin Geyken, and Peter Dawidowitsch, both of Munich, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

Division of Ser. No. 530,049, Dec. 5, 1974, Pat. No. 4,081,816. This application Sep. 22, 1977, Ser. No. 835,526

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1973, 2361151

Int. Cl.[2] G03D 3/02; G03C 5/24; C02B 1/18

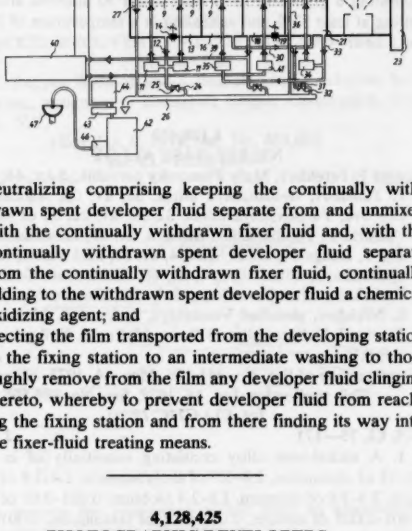
U.S. Cl. 96—63 9 Claims

1. A method of sewering the waste fluids produced by a photographic developing apparatus, the apparatus being of the type in which film to be developed is transported through a developing station where it is contacted by developer fluid and then through a fixing station where it is contacted by fixer fluid, the method comprising the steps of

continually withdrawing spent fixer fluid from the fixing station along a predetermined path and passing the continually withdrawn fixer fluid through a fixer-fluid treating means;

continually withdrawing spent developer fluid from the developing station along a predetermined path and sewering the continually withdrawn spent developer fluid;

chemically neutralizing the continually withdrawn spent developer fluid subsequent to its withdrawal from the developing station and prior to its sewering, the chemical



neutralizing comprising keeping the continually withdrawn spent developer fluid separate from and unmixed with the continually withdrawn fixer fluid and, with the continually withdrawn spent developer fluid separate from the continually withdrawn fixer fluid, continually adding to the withdrawn spent developer fluid a chemical oxidizing agent; and

subjecting the film transported from the developing station to the fixing station to an intermediate washing to thoroughly remove from the film any developer fluid clinging thereto, whereby to prevent developer fluid from reaching the fixing station and from there finding its way into the fixer-fluid treating means.

4,128,425

PHOTOGRAPHIC DEVELOPERS

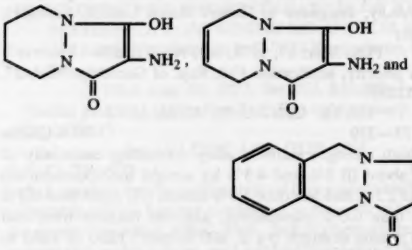
Richard B. Greenwald, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 6, 1977, Ser. No. 794,480

Int. Cl.[2] G03C 5/30, 1/06, 5/54

U.S. Cl. 96—66 HD 12 Claims

1. A photographic developer composition comprising an aqueous alkaline solution containing at least one silver halide developing agent selected from the group consisting of



and salts thereof.

4,128,426
PROCESS FOR SUBBING PHOTOGRAPHIC HYDROPHOBIC FILMS

Hideyasu Ohta; Takahiro Uozumi; Masaru Kanbe; Naoto Abe; Jun Shirasaki, and Masayoshi Mayama, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 772,082
Claims priority, application Japan, Mar. 1, 1976, 51-21986
Int. Cl.[2] B05D *3/06*
U.S. Cl. 96—87 R **12 Claims**

1. A process for subbing a photographic hydrophobic film which comprises subjecting at least one surface of the film to pretreatment to make the surface hydrophilic, coating the pretreated surface with an aqueous disperson containing a copolymer comprising, as main comonomers and in a combined amount of more than 76% by weight, (1) 20 to 90 weight % of glycidyl methacrylate and/or glycidyl acrylate and (2) 10 to 60 weight % of at least one comonomer represented by the formula:

wherein R_1 is hydrogen or lower alkyl and R_2 is an aliphatic hydrocarbon residue of 1 to 9 carbon atoms, provided that a polymer comprising 20 to 60 weight % of glycidyl methacrylate and 25 to 60 weight % of ethyl acrylate in a combined amount of more than 76 weight % is excluded to form a coated surface and coating said coated surface with a colloidal silica to form a second sub layer

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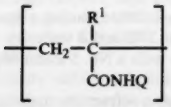
4,128,427
SILVER HALIDE EMULSIONS CONTAINING POLYMERIC COLOR COUPLERS

Marcel J. Monbaliu, Mortsel, and Raphaël K. Van Poucke, Berchem, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Jun. 6, 1977, Ser. No. 803,600
Claims priority, application United Kingdom, Jun. 15, 1976, 24779/76
Int. Cl.[2] G03C *1/40*
U.S. Cl. 96—100 R **7 Claims**

1. A photographic material comprising at least one silver halide emulsion layer and a latex of polymeric colour coupler wherein the polymeric colour coupler comprises:

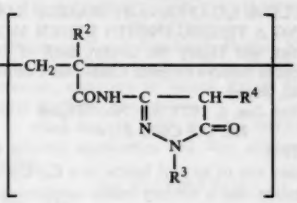
(a) from 10 to 60% by weight of colour coupler recurring units corresponding to the following structural formula I



I

wherein R^1 is hydrogen, an alkyl group or chlorine and Q is a colour coupler residue capable of coupling with an oxidized aromatic primary amine colour developing agent to form a dye, and

(b) from 5 to 50% by weight of competing coupler recurring units forming upon oxidative coupling with an oxidized aromatic primary amine colour developing agent a colourless compound and corresponding to the following structural formula II



II

wherein R^2 is hydrogen, an alkyl group or chlorine, R^3 represents a well known substituent in the 1-position of a 2-pyrazolin-5-one competing coupler and R^4 represents a C_1–C_5 alkyl group, and

(c) at least 5% by weight of one or more copolymerised ethylenically unsaturated monomer units that are not capable of oxidative coupling with the aromatic primary amino developing compounds,

the weight ratio of the colour coupler recurring units I to the competing coupler units II being between 10:1 and 1:2.

4,128,428
HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Shinpei Ikenoue; Takao Masuda; Nobuo Suzuki; Toshiharu Tanaka, and Kenji Sashihara, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 567,026, Apr. 10, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,792
Claims priority, application Japan, Apr. 10, 1974, 49-40700
Int. Cl.[2] G03C *1/02, 1/52, 1/66*
U.S. Cl. 96—114.1 **23 Claims**

1. A heat developable light-sensitive material comprising a support having thereon at least one layer and containing as essential components (a) an organic silver salt, (b) 0.001 mol to 0.5 mol per mol of organic silver salt of at least one N-halo compound capable of forming a light-sensitive silver halide by reaction with said organic silver salt and (c) a reducing agent, and with at least one layer containing (d) an iron family compound which prevents thermal fog selected from the group consisting of iron (II) nitrate, iron (III) nitrate, iron (II) acetate, iron (III) acetate, iron (II) formate, iron (III) formate, iron (II) sulfate, iron (III) sulfate, iron (II) perchlorate, iron (III) perchlorate, cobalt (II) nitrate, cobalt (III) nitrate, cobalt (II) acetate, cobalt (III) acetate, cobalt (II) formate, cobalt (III) formate, cobalt (II) sulfate, cobalt (III) sulfate, cobalt (II) perchlorate, cobalt (III) perchlorate, nickel (II) nitrate, nickel (II) acetate, nickel (II) formate, nickel (II) perchlorate and mixtures thereof or a complex compound of iron, cobalt or nickel said iron family compound being present in an amount of about 10^{-5} mole to 10^{-1} mole per mole of the organic silver salt (a).

21. In a process of producing the heat-developable light-sensitive material which comprises (1) reacting (a) an organic silver salt and (b) 0.001 mol to 0.5 mol per mol of organic silver salt of at least one N-halo compound (2) adding (c) a reducing agent to the reaction product of step (1), and (3) coating said mixture on a support, the improvement comprising adding (d) an iron family compound to said organic silver salt before or during said reaction (1), wherein said iron family compound prevents thermal fog and is selected from the group consisting of iron (II) nitrate, iron (III) nitrate, iron (II) acetate, iron (III) acetate, iron (II) formate, iron (III) formate, iron (II) sulfate, iron (III) sulfate, iron (II) perchlorate, iron (III) perchlorate, cobalt (II) nitrate, cobalt (III) nitrate, cobalt (II) acetate, cobalt (III) acetate, cobalt (II) formate, cobalt (III) formate, cobalt (II) sulfate, cobalt (III) sulfate, cobalt (II) perchlorate, cobalt (III) perchlorate, nickel (II) nitrate, nickel (II) acetate, nickel (II) formate, nickel (II) perchlorate and mixtures thereof or a complex compound of iron, cobalt or nickel said iron family compound being present in an amount of about 10^{-5} mole to 10^{-1} mole per mole of the organic silver salt (a).

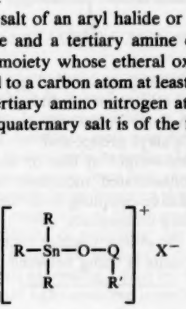
4,128,429

ANTIFOULING QUATERNARY HALIDE SALTS CONTAINING A TRIORGANOTIN ETHER MOIETY

Robert E. Wyant, and Henry M. Grotta, both of Delaware, Ohio, assignors to Sankyo Organic Chemicals Company Limited, Kawasaki, Japan

Filed Jan. 6, 1977, Ser. No. 757,240
Int. Cl.² C09D 5/14
U.S. Cl. 106—15 R **8 Claims**

1. A quaternary salt of an aryl halide or a C_8–C_{24} aliphatic hydrocarbon halide and a tertiary amine containing a triorganostannyl ether moiety whose etheral oxygen atom links a triorganotin radical to a carbon atom at least two carbon atoms removed from a tertiary amino nitrogen atom of the tertiary amine, and which quaternary salt is of the formula

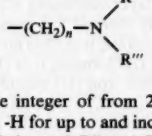


wherein

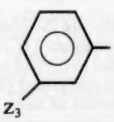
X is Cl, Br, or I, each R is an alkyl radical of up to 12 carbon atoms with the sum total of the carbon atoms in the three not exceeding 24, with no more than one of the three containing more than 4 carbon atoms, and with each of the three not necessarily the same R,

R′ is an aryl hydrocarbon radical, or a C_8–C_{24} alkyl radical, and

Q is a quaternized moiety of a tertiary amine moiety selected from the group consisting of an aliphatic tertiary amine moiety of the structure



wherein n is a whole integer of from 2 to 5, and a methyl radical may replace a -H for up to and including two of the -H in the $-(CH_2)_n-$ chain, and R″ and R‴ are C_1–C_{10} alkyl radicals which are not necessrily the same, and a tertiary amine structural moiety including an aromatic ring of the structure



wherein Z is the same or different and at least one Z is $-NR_2$ or $-(CH_2)_nNR_2$ and any remaining Z is H, with R an alkyl radical having from 1 to 4 carbon atoms, and n is a whole number integer of from 1 to 5.

7. A coating composition for an article to be used in water to inhibit marine fouling thereof which comprises a resinous polymer and an amount effective to prevent fouling of a quaternary salt of an aryl halide or a C_8 to C_{24} aliphatic hydrocarbon halide and a tertiary amine containing a triorganostannyl ether moiety whose ethereal oxygen atoms links a triorganotin radical to a carbon atom at least two carbon atoms removed from a tertiary amino nitrogen atom of the tertiary amine, said quaternary salt having the formula recited in claim 1.

4,128,430

MASTER SHEETS AND PROCESS FOR PRINTING SAME

Douglas A. Newman, Glen Cove, and Robert T. Emerson, Manhasset, both of N.Y., assignors to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,512
Int. Cl.² C09D 11/06, 11/12
U.S. Cl. 106—31 **3 Claims**

1. A semi-solid printing ink composition comprising a solidifiable, oil-resistant binder material from the group consisting of wax, resin and mixtures thereof, at least one non-volatile liquid material which is substantially incompatible with said binder material and which comprises at least one acrylic resin-forming material which is stable at ordinary room temperatures but which is capable of undergoing polymerization when exposed to activating conditions, a quantity of coloring matter which is soluble in said liquid material, and a sufficient amount of a volatile liquid having a boiling point within the range of from about 200° F. to about 460° F. to render said composition substantially non-flowable at ordinary room temperatures in the absence of applied force said ink composition being printable in image form onto a master sheet and solidifiable by evaporation of said volatile liquid, without causing said resin-forming material to polymerize, to form images having a skeletal microporous structure of said binder material bonded to said master sheet and containing within the pores thereof said non-volatile liquid comprising said resin-forming material and dissolved coloring matter as a flowable ink which is pressure-exudable from said images to form a multiplicity of duplicate images which can be exposed to activating conditions to polymerize said resin-forming material and render said duplicate images resistant to removal.

4,128,431

COMPOSITION FOR MAKING AN INVESTMENT MOLD FOR CASTING AND SOLIDIFICATION OF SUPERALLOYS THEREIN

Paul S. Svec, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 590,970, Jun. 27, 1975, Pat. No. 4,024,300.
This application Sep. 8, 1976, Ser. No. 721,536
Int. Cl.² B28B 7/34
U.S. Cl. 106—38.35 **4 Claims**

1. In a primary slurry mixture having a specific gravity of from about 2.36 to about 2.42 and a viscosity of from about 7 to about 10 as measured with a No. 5 Zahn cup for making an investment mold comprising

water, a wetting agent, a refractory material in amounts of from about 65% to about 73% and;

a binder material comprising an aqueous based colloidal silica solution having a silica content of from 15 percent to 36 percent;

the improvement comprising, as said refractory material, a mixture of three different grain sizes of fused alumina having grain sizes within the range of about 240 to about 400 mesh, U.S. Sieve Series; said mixture comprising 70 to 75% by weight of largest grain size, 10 to 20% by weight of medium grain size and the balance of smallest grain size.

4,128,432

OPTICAL GLASS

Fujio Komorita, Hachioji, and Muneo Nakahara, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho, Sagamihara, Japan

Filed May 8, 1978, Ser. No. 903,412
Claims priority, application Japan, May 19, 1977, 52-57047
Int. Cl.[2] C03C *3/10, 3/00*
U.S. Cl. 106—53 1 Claim

1. An optical glass consisting of a composition in weight percent of 3 to 30% B_2O_3, 0 to 19.5% SiO_2, the sum of said B_2O_3 and SiO_2 being 18 to 30%, 9 to 32% La_2O_3, 1 to 8% ZrO_2, 4 to 25% Nb_2O_5, 2 to 50% PbO, 0 to 30% BaO, 0 to 9.5% ZnO, the sum of said BaO and ZnO being 1 to 33%, 0 to 3% Li_2O, 0 to 3% Na_2O, 0 to 3% K_2O, 0 to 8% MgO, 0 to 10% CaO, 0 to 20% SrO, 0 to 5% Al_2O_3, 0 to 0.5% As_2O_3, 0 to 0.5% Sb_2O_3, 0 to 5% Bi_2O_3, 0 to 13% TiO_2, 0 to 5% GeO_2 and 0 to 10% Ta_2O_5.

4,128,433

DENSE AND IMPERVIOUS STABILIZED HAFNIUM OXIDE CERAMIC

William R. Manning, Richmond, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Continuation-in-part of Ser. No. 782,010, Mar. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 698,414, Jun. 21, 1976, abandoned. This application May 15, 1978, Ser. No. 906,063
Int. Cl.[2] C04B *35/00, 35/50*
U.S. Cl. 106—55 1 Claim

1. A method for producing a gas impervious ceramic article, said method consisting essentially of producing an intimate dry mixture consisting essentially, on an oxide basis, of hafnia, yttria and at least one oxide selected from the group consisting of silica, alumina, calcia, magnesia, baria and strontia, yttria constituting substantially 8 to 12 mole percent of said article based upon the total number of moles of hafnia and yttria, and silica, alumina, calcia, magnesia, baria and strontia constituting from ¼ percent to 4 percent, based upon the weight of hafnia and yttria, with the proviso that calcia, magnesia, baria and strontia constitute not more than 70 percent by weight of the total of silica, alumina, calcia, magnesia, baria and strontia, pressing the dry mixture into a predetermined shape, and sintering the shape to a gas impervious condition at a temperature from 2700° F. to 3000° F.

4,128,434

HIGH DENSITY ASBESTOS-FREE TOBERMORITE THERMAL INSULATION CONTAINING WOLLASTONITE

Walter G. Pusch, Westford, Mass., assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 717,807, Sep. 17, 1976, abandoned. This application Jun. 23, 1977, Ser. No. 809,505
Int. Cl.[2] C04B *1/00*
U.S. Cl. 106—120 10 Claims

1. A high density asbestos-free thermal insulation body formed by slurrying a mixture consisting essentially of, in parts by weight: 15 to 40 parts lime, 20 to 40 parts by weight of a siliceous component, and 15 to 40 parts by weight wollastonite, said mixture containing no asbestos fiber, in at least one part by weight water per part by weight of dry solids in said mixture; molding the slurry to a shape-retaining body having a density of at least 20 pcf; and thereafter curing said molded body in an atmosphere of steam at elevated pressure for a sufficient time to cause the lime, siliceous component, and water to form a calcium silicate hydrate matrix consisting essentially of tobermorite crystalline phase and reinforced by said wollastonite.

4,128,435

LUSTROUS PIGMENTS FOR PIGMENTING CASEIN PLASTICS

Wilhelm Bäumer; Horst Bernhard; Reiner Esselborn; Jörg Ohngemach; Otto Stahlecker, and Fritz Zureda, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Germany

Filed Jun. 24, 1977, Ser. No. 809,811
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628353
Int. Cl.[2] C09J *3/24*
U.S. Cl. 106—148 7 Claims

1. A pigmented casein plastic molding composition for molding by compression and heating into articles of manufacture substantially free from cracks and pores visible at 1 : 100 magnification, wherein the pigment is a minor luster-imparting quantity of lustrous pigments of coated mica platelets, wherein at least 75% of the pigment particles possess an average main diameter of below 10 μm. and not lower than about 2μm., a thickness of about 0.1 to 0.7μm. and a ratio of diameter to thickness of about 10 to 1 to 200 to 1.

4,128,436

RHEOLOGICAL AGENTS

Kevin J. O'Hara, Maidstone, England, and Howard J. Kilvington, Rhiwbina, Wales, assignors to Coats Brothers & Company Ltd., London, England

Continuation of Ser. No. 572,865, Apr. 29, 1975, abandoned. This application Dec. 30, 1976, Ser. No. 755,743
Claims priority, application United Kingdom, May 29, 1974, 23700/74
Int. Cl.[2] C08L *91/00;* C09D *11/06*
U.S. Cl. 106—243 18 Claims

1. A rheological control agent comprising a particulate blend of hydrogenated castor oil and an oligomeric polyamide derived from hdroxystearic acid, at least one saturated aliphatic α -omega diprimary diamine containing 2, 4, 6, 8 or 10 carbon atoms and at least one saturated aliphatic α -omega dicarboxylic acid containing from 2 to 12 carbon atoms and/or hydrogenated dimer acid, said oligomeric polyamide being derived from the reaction of said hydroxystearic acid, dicarboxylic acid and a diamine in such proportions that for each mole of hydroxystearic acid there are present 0.05 - 0.5 moles of dicarboxylic acid and a quantity of diamine sufficient to provide of from 0.8 to 1.15 amine groups for each carboxyl group in the acid mixture where in the weight ratio of hydrogenated castor oil to oligomeric amide is from 9:1 to 1:9.

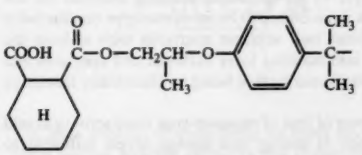
4,128,437

TRANSPARENTIZING AGENT FOR PAPER

Shigeru Ura, Toyonaka; Norio Kondo, Minoo; Yoshiya Fukuyama, Hirakata, and Makoto Nakahara, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 527,382, Nov. 26, 1974, abandoned. This application May 28, 1976, Ser. No. 691,065
Claims priority, application Japan, Nov. 26, 1973, 48/133177; Aug. 1, 1974, 49/88713
Int. Cl.[2] C09K *3/00*
U.S. Cl. 106—287.24 3 Claims

1. A transparentizing composition for paper comprising at least member selected from the group consisting of a compound of the formula:



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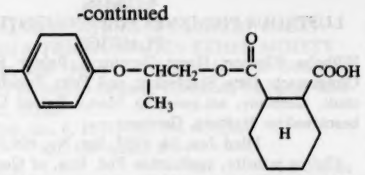


and the alkali metal, ammonium and lower alkyl amine salts thereof; and a solvent selected from the group consisting of water and organic solvents.

4,128,438

GRANULATE FORM ORGANOSILANE PREPARATION

Siegfried Wolff, Bornheim-Merten, and Lothar Rothbuhr, Hurth-Hermulheim, both of Germany, assignors to Deutsche Gold- und Silber- Scheideanstalt vormals Roessler, Frankfurt, Germany

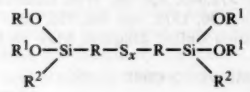
Filed Jan. 31, 1978, Ser. No. 873,967

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747277

Int. Cl.[2] C08J *3/12*; C08K *3/04, 3/34*; C09C *1/58*

U.S. Cl. 106—307 **11 Claims**

1. A granulate organosilane composition consisting of (a) 30 to 60 weight percent of an organosilane of the formula



where R^1 is an alkyl group with 1 to 3 carbon atoms, R^2 is an alkyl or alkoxy group with 1 to 3 carbon atoms, R is an alkylene group with 1 to 5 carbon atoms and x has a value from 2.0 to 6.0, and (b) 70 to 40 weight percent of carbon black.

4,128,439

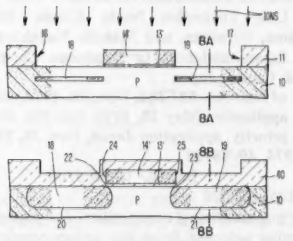
METHOD FOR FORMING SELF-ALIGNED FIELD EFFECT DEVICE BY ION IMPLANTATION AND OUTDIFFUSION

Chakrapani G. Jambotkar, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,991

Int. Cl.[2] H01L *21/265*

U.S. Cl. 148—1.5 **12 Claims**



4. A method for making a field effect transistor comprising:

forming a layer of an ion beam masking material on the surface of a semiconductor body of one-type conductivity having at least two adjacent apertures with at least the portion of said masking layer between said apertures and in contact with said surface being an electrically insulative material,

directing a beam of ions of opposite-type conductivity at said masked body at energy and dosage levels sufficient to form two buried regions of opposite-type conductivity fully enclosed within said one-type conductivity body respectively beneath said two apertures, and

heating to diffuse said two buried regions upward until the upward diffusion of said buried regions respectively extend to said surface beneath said two apertures while the downward diffusion front remains spaced from the lower surface of the said semiconductor body,

said masking material having a melting point above the temperature of said diffusion step.

4,128,440

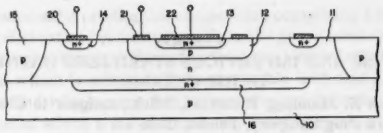
LIQUID PHASE EPITAXIAL METHOD OF COVERING BURIED REGIONS FOR DEVICES

Bantval J. Baliga, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,118

Int. Cl.[2] H01L *21/208*

U.S. Cl. 148—171 **17 Claims**



1. The method of forming a buried region in a monocrystalline silicon wafer, said buried region being of predetermined conductivity type, comprising the steps of:

forming a region of said predetermined conductivity type within said monocrystalline silicon wafer; and

depositing silicon from a melt of conductivity type determining impurities supersaturated with silicon, epitaxially atop said wafer and said region of predetermined conductivity type to form a silicon layer thereon of conductivity type determined by said impurities in said melt.

4,128,441

SOLUBILITY OF NPGA IN A POLYURETHANE BINDER

Marjorie T. Cucksee, Huntsville, and Henry C. Allen, Decatur, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1977, Ser. No. 856,437

Int. Cl.[2] C06B *45/10*

U.S. Cl. 149—19.92 **1 Claim**

1. In a mixing process for a polyurethane propellant composition that is curable to a solid propellant grain wherein the binder ingredients consisting of poly(neopentylglycol)azelate, poly(1,2 butyleneoxide)glycol, polymeric 1,2 propylene oxide adduct of trimethylolpropane, isodecylpelargonate, and N,N bis(2 cyanoethyl)2,3 dihydroxypropylamine are combined in a propellant submix and wherein the solids ingredients comprising oxidizer, fuel, curing catalysts, and additives are added to and mixed thoroughly with said propellant submix and with subsequent addition and mixing of a curing agent hexamethylene-diisocyanate which cures said polyurethane propellant to a solid grain, the improvement in said mixing process which enhances the solubility of said poly(neopentylglycol)azelate in said polyurethane propellant composition comprising:

(i) combining and mixing together in a propellant submix said binder ingredients consisting of poly(1,2 butyleneoxide)glycol, polymeric 1,2 propylene oxide adduct of trimethylolpropane, isodecylpelargonate, and N,N bis(2 cyanoethyl)2,3 dihydroxylpropylamine;

(ii) adding and mixing said solid ingredients with said propellant submix;

(iii) adding and mixing said curing agent hexamethylenediisocyanate with said propellant submix and said solids and allowing said hexamethylenediisocyanate to partially react with said binder ingredients;

(iv) continue said mixing of said propellant submix, said solid ingredients, and said curing agent, which comprises the

propellant mix, for a predetermined period of time until a break in viscosity occurs, said break in viscosity being evident when said propellant mix changes in appearance from a dry to a fluid condition; and

(v) adding and mixing said poly(neopentylglycol)azelate with said propellant mix in which said poly(neopentylglycol)azelate exhibits enhanced solubility in said binder ingredients as evidenced by a lower end-of-mix viscosity and superior flow characteristics of the uncured polyurethane propellant composition, and as further evidenced by the improved physical properties of the cured polyurethane propellant composition, said improved physical properties including a higher stress to modulus ratio as compared with a like propellant composition in which said poly(neopentylglycol)azelate was added and mixed in said propellant submix during mixing process for polyurethane propellant composition.

4,128,442

EMULSIFIED METHANOL CONTAINING EXPLOSIVE COMPOSITION

Kenneth N. Barlow, Kempton Park, South Africa, assignor to AECI Limited, Johannesburg, South Africa

Filed Feb. 21, 1978, Ser. No. 879,493

Claims priority, application South Africa, Feb. 23, 1977, 77/1069

Int. Cl.[2] C06B *31/28*

U.S. Cl. 149—46 **7 Claims**

1. A non-aqueous slurry explosive composition comprising an oxidising salt component, a fuel component, methanol and a metal nitrate or perchlorate soluble in the methanol.

4,128,443

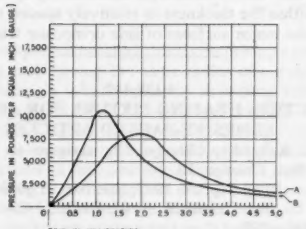
DEFLAGRATING PROPELLANT COMPOSITIONS

Daniel E. Pawlak, 5902 212th SE., Issaquah, Wash. 98027, and Michael Levenson, 2591 Queenston Rd., Cleveland Heights, Ohio 44118

Filed Jul. 24, 1975, Ser. No. 598,850

Int. Cl.[2] C06B *31/10, 31/06, 29/12, 29/06*

U.S. Cl. 149—71 **8 Claims**



1. In a deflagrating gas generating composition for producing controlled gas pressure which imparts high velocity to projectiles at relatively low peak pressure, the improvement which comprises employing, as the essential gas-producing elements, approximately 82.5–30 parts by weight of an oxidizing agent selected from the group consisting of ammonium, alkali metal, and alkaline earth nitrates, chlorates and perchlorates; approximately 14.5–45 parts by weight of an oxidizable derivative of an organic carboxylic acid selected from the group consisting of ammonium and alkali metal salts of aromatic carboxylic acids; and approximately 25–1.0 parts by weight of water.

4,128,444

MANUFACTURE OF PHARMACEUTICAL UNIT DOSAGE FORMS

Arthur R. Mlodozeniec, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 641,068, Dec. 15, 1975, abandoned. This application Aug. 10, 1977, Ser. No. 823,363

Int. Cl.[2] A61K *9/10*

U.S. Cl. 156—64 **3 Claims**

1. A method of preparing solid pharmaceutical unit dosage forms comprising loading one or more medicaments to a therapeutically inert, edible web, fabricating said web into a solid geometric form of predetermined dimensions having said medicament substantially internalized, said form being divisible into a plurality of unit dosage forms, unitizing said geometric form into said plurality of unit dosage forms and sealing said unit dosage forms to completely internalize said medicament wherein said procedures include at least one non-destructive testing operation to assure quality of said unit dosage forms, said method further including printing of appropriate indicia on said unit dosage forms, wherein said printing is carried out during said fabrication, unitizing or sealing procedures.

4,128,445

MANUFACTURE OF PHARMACEUTICAL UNIT DOSAGE FORMS

August Sturzenegger, Essex Fells; Arthur R. Mlodozeniec, Montclair, both of N.J., and Edward S. Lipinsky, Columbus, Ohio, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 640,654, Dec. 15, 1975, abandoned. This application Aug. 18, 1977, Ser. No. 825,746

Int. Cl.[2] A61K *9/70*

U.S. Cl. 156—64 **11 Claims**

1. A method of preparing solid pharmaceutical unit dosage forms comprising loading one or more medicaments to a therapeutically inert, edible web, fabricating a single sheet of said loaded web into a solid geometric form of predetermined shape having said medicament substantially internalized, said form being divisible into a plurality of unit dosage forms, unitizing said geometric form into said plurality of unit dosage forms and sealing said unit dosage forms to completely internalize said medicament said procedures including at least one non-destructive testing operation to assure uniform quality of said unit dosage forms.

4,128,446

METHOD FOR EMBEDDING TIRE CHAINS IN THE TREAD PORTION OF A TIRE

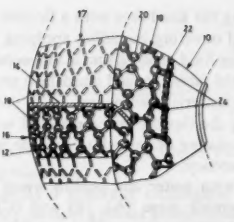
Hans O. Dohmeier, Johannesburg, South Africa, assignor to Dome Inventions (Proprietary) Limited, Johannesburg, South Africa

Filed Jan. 21, 1977, Ser. No. 761,540

Claims priority, application South Africa, Feb. 16, 1976, 76/0914

Int. Cl.[2] B29H *17/38*

U.S. Cl. 156—114 **6 Claims**



1. In a method of embedding an open network protective chain having wearing members and connectors interconnect-

ing the wearing members at least partially into the tread portion of a tire having a casing and a tread portion, including the steps of fitting the protective chain over a layer of uncured rubber forming part of the thread portion of the tire and forcing the protective chain into the uncured rubber; the improvement of mounting the tire on a hub; fitting the protective chain to the tire, the tire being uninflated and the protective chain being annular; inflating the tire until it is firm; connecting a plurality of flexible, substantially inextensible, elongate elements on each side of the tire to the protective chain at regularly spaced locations to project radially inwardly towards the axis of the tire and outwardly from the adjacent side of the tire; tensioning the elongate elements to apply a radially inwardly directed force to the protective chain thereby uniformly and simultaneously at all circumferential locations of the tire to urge the protective chain into the layer of uncured rubber; and applying radiant heat to the protective chain and the uncured rubber to soften the rubber to permit embedding of the protective chain while the elongate elements are being tensioned.

4,128,447

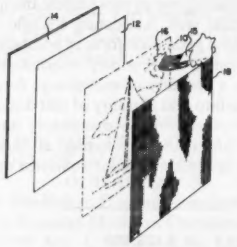
METHOD AND ARTICLE TREATING PICTURES

Marjorie A. Rork, 2033 Sherman Ave., Evanston, Ill. 60201

Continuation-in-part of Ser. No. 632,466, Nov. 17, 1975, abandoned. This application Jun. 24, 1977, Ser. No. 809,867

Int. Cl.[2] B32B *31/12, 31/22*

U.S. Cl. 156—155 **6 Claims**



1. The method of making a picture viewable in reverse from opposite sides and having picture-portraying elements directly contacting and carried on an opaque water absorbent paper base for direct viewing comprising;

(A) applying to the exposed face of the picture elements a layer of liquid sizing material that is transparent and non-water soluble when dry, drying said sizing material and adhering the picture portraying elements permanently thereto,

(B) reinforcing the sized face with a flexible fabric reinforcing material covering including applying a varnish adhesive finishing fluid coating that is non-soluble in water for adhering said fabric to said sized face and rendering the reinforcing material transparent,

(C) saturating the flexible fabric material with a permanent protective coating of varnish to provide maximum reflective transparency,

(D) soaking with water and peeling away the paper base after performing steps (A), (B) and (C) to render the picture elements transparently viewable from the other side in reverse relation, and

(E) directly coating the back of the viewable picture elements with a permanent non-water soluble transparent adhesive.

4,128,448

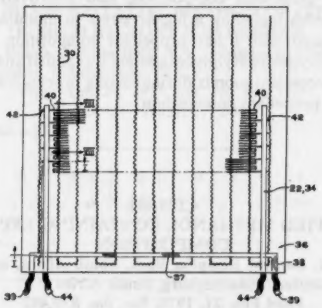
METHOD OF PREPARING LIGHTWEIGHT WINDOW ANTI-STATIC CIRCUIT AND OPTIONAL HEATING CIRCUIT

Michael G. Bitterice, New Kensington, and Leroy D. Keslar, Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 700,239, Jun. 28, 1976, Pat. No. 4,078,107. This application Dec. 16, 1977, Ser. No. 861,466

Int. Cl.[2] B29D *3/00*

U.S. Cl. 156—166 **13 Claims**



1. A method of making a composite transparency comprising applying a pattern of wire to an opposite pair of major surfaces of a first layer of rigid transparent plastic selected from the class consisting of acrylic plastic and polycarbonates, one of said patterns comprising relatively widely spaced runs of continuous wire and the other of said patterns comprising relatively closely spaced runs of continuous wire, press polishing said layer of rigid transparent plastic at sufficient heat and pressure to smooth the opposite major surfaces thereof so that the wire is embedded just below each of the opposite major surfaces, attaching suitable terminal means to the wire embedded adjacent each of the opposite surfaces, and fusing a second layer of rigid transparent plastic selected from the class consisting of acrylic plastic and polycarbonates at elevated pressure and temperature against the first layer of plastic having the wires embedded therein to form a composite transparency having wire with widely spaced runs embedded adjacent a major surface thereof and wire with closely spaced runs embedded within the thickness in relatively spaced relation from the opposite major surfaces of side composite transparency.

4,128,449

INDUCTION HEATING FIXTURE FOR APPLYING ADHESIVE-BACKED ARTICLES

Robert G. Kobetsky, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

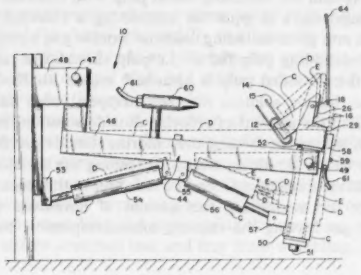
Filed Sep. 28, 1977, Ser. No. 837,059

Int. Cl.[2] B32B *19/02;* **B23K** *13/02*

U.S. Cl. 156—380 **17 Claims**

1. In a fixture for adhesively securing discrete, substantially flat based adhesive carrying metal articles to a support surface, including a carrier structure with an aritcle applying head structure mounted thereon, the head structure comprising a U-shaped inductor core with exciter coil means wrapped about a section thereof serving to generate a magnetic flux circuit through said core and a portion of the metal article bridging the end surfaces of the legs of the core, the head structure further comprising an article receiving and positioning element fixedly mounted to the core to retain, predetermined, laterally spaced upper surface regions of the metal article in substantially fixed abutting contact with the end surfaces of the core during the positionment of the article on the support surface, the head structure and mounting means therefore including

means to permit free compound movement of the core in a direction transverse an axis of the carrier structure which extends so as to intersect the support surface with the metal article fixedly positioned relative to the core as the head and



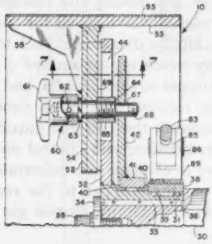
carrier apply the metal article to the support surface so as to accurately and firmly position the article into conforming surface contact with a predetermined area of said support surface during the generation of heat in said article to activate the adhesive.

4,128,450

TIRE COMPONENT BUILDING DRUM

Armindo Cantarutti, Akron, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Mar. 30, 1977, Ser. No. 782,994
Int. Cl.[2] B29H *17/16*
U.S. Cl. 156—417 **4 Claims**



1. A tire component building drum comprising a set of circular segments each having the same radius of curvature, each segment including a radially inwardly extending stem, support means mounting said stems for movement radially to expand and contract said segments, cam means rotatably mounted on said support means, and stud means connecting each said stem to said cam means on the same side of said stem, with said stud means projecting from the opposite side of each stem, whereby said stud means may readily be removed and said segments replaced by another set of segments each having another same radius of curvature.

4,128,451

ROLLER MEMBERS FOR USE IN HEAT SEALING APPARATUS

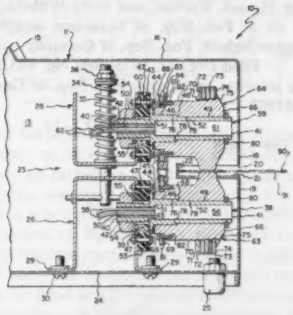
Peter S. Sorce, Tonawanda, and Earl W. Clifford, Getzville, both of N.Y., assignors to The Aro Corporation, Bryan, Ohio

Filed Apr. 4, 1977, Ser. No. 784,283
Int. Cl.[2] B31F *5/00*; B32B *31/00*; B30B *15/34*
U.S. Cl. 156—555 **9 Claims**

1. In apparatus for heat sealing a thermally-sensitive material to a substrate material, said apparatus having a frame, having a tubular first shaft mounted fast to said frame and arranged to be heated by a first heating element arranged within said first shaft, and having a second shaft mounted fast to said frame, the improvement comprising:

a first roller member rotatably mounted on said first shaft and having a first outer peripheral surface, said first roller member being adapted to conduct heat from said first shaft to said first peripheral surface, a portion of said first peripheral surface defining at least one annular groove extending radially into said first roller member;

a second roller member rotatably mounted on said second shaft and having a second outer peripheral surface arranged to face said first peripheral surface, a portion of said second peripheral surface forming an annular peak aligned with said groove; and



biasing means mounted on said frame for urging said first and second peripheral surfaces to move toward one another with such force that said thermally-sensitive and substrate materials will contact said roller members in the vicinity of said first and second peripheral surfaces but will not contact said first roller member in the vicinity of the depth of said annular groove, and wherein the portion of said second surface forming said peak is spaced from the portion of said first surface defining said groove in the absence of said materials therebetween;

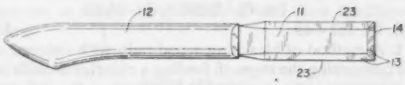
whereby, when said materials are translated between said roller members, less heat may be supplied in the vicinity of said groove than in the vicinity of said peak.

4,128,452

APPARATUS FOR SEPARATING ADHESIVELY CONNECTED MATERIAL

Herbert E. Johnson, 1023 Phelps Ave., San Jose, Calif. 95117, and William W. Richards, 984 Corbett Ave., San Francisco, Calif. 94131

Filed Aug. 1, 1977, Ser. No. 820,513
Int. Cl.[2] B32B *31/00*; B25F *3/00*; B26B *3/06*
U.S. Cl. 156—584 **4 Claims**



1. An apparatus for separating adhesively connected material which comprises:

(a) a blade having a generally rectangular frontal portion with an upper surface, a planar lower surface and a surface angularly inclined from said upper surface to said lower surface, the intersection of said lower surface and said angularly inclined surface defining a straight leading cutting edge and side cutting edges, said blade having a rear portion upwardly inclined;

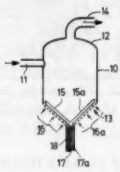
(b) a handle means for gripping connected to said rear portion of said, blade;
(c) a sheath for retaining said blade, said sheath having inner walls of absorbent material; and
(d) a lubricant generally equally distributed throughout the inner absorbent walls of said sheath, whereby said lubricant is applied to all of said surfaces of said blade when said blade is inserted into and withdrawn from said sheath.

4,128,453

PROCESS AND APPARATUS FOR REMOVING EVAPORABLE COMPONENTS FROM POLYAMIDE MELTS

Dieter Angerer, Grosskrotzenburg; Peter Freund, Bad Vilbel; Werner Hansel, Karben, and Fritz Wilhelm, Offenbach am Main, all of Fed. Rep. of Germany, assignors to Zimmer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1975, Ser. No. 643,385
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1974, 2461901
Int. Cl.[2] B01D *1/14*
U.S. Cl. 159—16 S **3 Claims**



1. Apparatus for removing evaporable components from polyamide melts at subatmospheric pressure and under constant agitation while simultaneously conducting a gaseous medium through the melt, comprising an evacuable container having a perforated surface disposed in the lower part thereof, means for feeding the polyamide melt into said container and over said surface, a feed line for conducting the gaseous medium through said perforated surface into the melt, a discharge conduit connecting to said container for removing the gaseous medium enriched with the evaporable components, an agitating device for the polyamide melt, wherein the active parts of the agitating device comprise agitating blades arranged to move over the surface parallel to it at a slightly spaced distance from said perforated surface to enhance formation of gas bubbles in the melt and simultaneously enhance intermixing of gas in the melt, and a discharge worm for the polyamide melt which is structurally united with the agitating device.

4,128,454

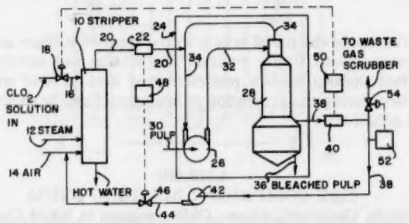
SYSTEM AND METHOD FOR GAS PHASE PULP BLEACHING

Rudi W. Schleinkofer, Nashua, N.H., assignor to Ingersoll-Rand Co., Woodcliff Lake, N.J.

Filed Dec. 7, 1977, Ser. No. 858,265
Int. Cl.[2] D21C *9/14, 11/06*
U.S. Cl. 162—49 **2 Claims**

1. A method of bleaching wood pulp with chlorine dioxide gas comprising the steps of: feeding a chlorine dioxide solution to a stripper and converting in said stripper the chlorine dioxide solution into gases including chlorine dioxide gas; conducting the resulting gases to a reaction area and reacting said chlorine dioxide gas with pulp to bleach said pulp; recycling unreacted gases leaving the reaction area back to the stripper; continuously monitoring the concentration of unused chlorine dioxide gas in the gases leaving the reaction area; automatically adjusting the amount of chlorine dioxide solution fed to the stripper in response to changes in the unused chlorine dioxide gas leaving the reaction area; continuously monitoring the concentration of chlorine dioxide gas in the gases conducted from the stripper to the reaction area; and automatically adjusting the amount of recycled unused gases conducted back to the stripper in response to changes in the concentration of chlorine dioxide gas conducted from the stripper to the reaction area.

2. A system for bleaching wood pulp with chlorine dioxide gas comprisng: a stripper for converting a chlorine dioxide solution into gases including chlorine dioxide gas; a pulp shredder for shredding pulp fed to the pulp shredder; a reactor in which the shredded pulp is bleached; means for feeding the chlorine dioxide solution into the stripper; valve means for controlling the amount of chlorine dioxide solution fed to the stripper; means for feeding the chlorine dioxide gas from the stripper to the shredder; means for feeding the shredded pulp and chlorine dioxide gas from the shredder to the reactor; a gas analyzer for monitoring the amount of unreacted chlorine dioxide gas leaving the reactor; means responsive to signals



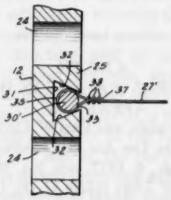
from the gas analyzer to automatically adjust said valve means to automatically adjust the amount of chlorine dioxide solution fed to the stripper in response to changes in unreacted chlorine dioxide gas leaving the reactor; means for recycling unreacted chlorine dioxide gas leaving the reaction area back to the stripper; recirculating valve means for controlling the flow of the unreacted chlorine dioxide gas back to the stripper; means for continuously measuring the amount of chlorine dioxide gas fed from the stripper to the shredder; and control means interconnecting the recirculating valve control means and the means for measuring the chlorine dioxide gas fed from the stripper to the shredder; said control means being automatically responsive to changes in concentration of chlorine dioxide gas fed from the stripper to the reactor to change the amount of unreacted chlorine dioxide gas recirculated back to the stripper.

4,128,455

HEADBOX TRAILING ELEMENT MOUNTING AND METHOD

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed May 20, 1977, Ser. No. 798,800
Int. Cl.[2] D21F *1/02, 1/06*
U.S. Cl. 162—216 **21 Claims**



18. A method of maintaining trailing element sheets substantially free from wrinkling in the presence of heated papermaking stock in the slice chamber of a papermaking machine headbox having a flow divider plate between a slice chamber and a

preslice chamber, said sheets extending downstream in said slice chamber, comprising:

providing anchor rods of greater coefficient of thermal expansion than the thermal coefficient of expansion of the sheets

attaching the trailing element sheets to the rods in a manner to hold the sheets substantially taut laterally;

and mounting said rods and thereby the upstream ends of said sheets on said plate in a manner permitting the rods freedom for thermal expansion;

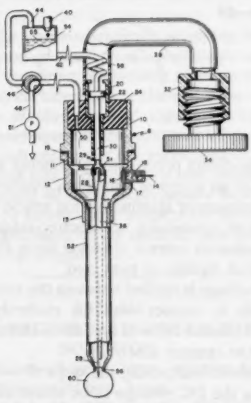
whereby greater rate of expansion of more directly heated downstream areas of the sheets in the slice chamber than the rate of expansion of upstream areas of the sheets will be compensated for by heat of the heated papermaking stock thermally expanding and lengthening the rods and thereby stretching and maintaining the upstream areas of the sheets stretched taut and free from wrinkling.

4,128,456

SUCTION ELECTRODE FOR INTRACELLULAR POTENTIAL MEASUREMENT

Kai S. Lee, 5800 Seawall Blvd.; Norio Akaike, 300 N. Ferry Rd., Apt. 1104, and Arthur M. Brown, 0915 Seewall Blvd., #216, all of Galveston, Tex. 77550

Filed Oct. 11, 1977, Ser. No. 840,826
Int. Cl.[2] C12K *1/10*
U.S. Cl. 195—127 **8 Claims**



1. A suction electrode for intracellular measurement comprising:

a perfusion chamber means terminating in an aperture at one end;

means for evacuating said perfusion chamber to capture and hold a living cell at said perfusion chamber aperture;

a perfusion tube means mounted and supported in said perfusion chamber;

means for controlled movement of said perfusion tube means toward and away from the captured cell;

cell sensing means movable with said perfusion tube for passage through said perfusion chamber aperture, penetration of the captured cell and sensing cell internal electrical activity;

means for delivering an electrically conductive cell life support fluid to the captured cell through said perfusion tube;

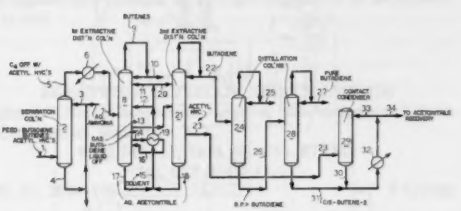
means for conduction of sensed intracellular electrical signals from the interior of said perfusion chamber to external equipment.

4,128,457

PROCESS FOR THE SEPARATION OF BUTADIENE BY PLURAL STAGE EXTRACTIVE DISTILLATION

Diego Barba; Candido D'Agostini, and Aldo Pasquinelli, all of Rome, Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Mar. 9, 1977, Ser. No. 776,042
Int. Cl.[2] B01D *3/40*; C07C *7/08*
U.S. Cl. 203—29 **13 Claims**



1. A process for the separation and recovery of 1,3-butadiene from a hydrocarbon mixture containing it, which comprises:

introducing into an extractive distillation column having at least 150 plates, operating at a pressure of 3.5–5.5 atmospheres and at a bottom temperature of 110°–140° C. and head temperature of 30°–50° C., a stream of vaporized hydrocarbon fraction containing butadiene together with butenes and acetylene hydrocarbons at a point intermediate between the head and the bottom and feeding aqueous acetonitrile at one or more points of the columm between the head and the point of introduction of the hydrocarbon fraction; recovering at the head of the column a stream consisting essentially of butenes, recovering at the bottom aqueous acetonitrile and removing at an intermediate point, situated lower than that of the introduction of the hydrocarbon fraction, a vapor stream containing butadiene;

feeding into a second extractive distillation column, having at least 80 plates and operated at temperatures and pressures in the range of those of the first column, the vapor stream containing butadiene extracted from the said first extractive distillation column, at a point intermediate between the head and the bottom, feeding aqueous acetonitrile at one or more points situated between the head of the second extractivedistillation column and the point of introduction of the vapor stream containing butadiene; recovering at the head of the second extractive distillation column a stream consisting essentially of butadiene, at the bottom aqueous acetonitrile, while removing a vapor stream consisting essentially of acetylene hydrocarbons at a point of the second extractive distillation column located between the bottom and the feed point of the vapor stream containing butadiene;

subjecting the head product of the second extractive distillation column to rectification in a third distillation column to remove the last traces of products with a lower boiling point than butadiene at the head of said third distillation column and of those with a higher boiling point than butadiene as a bottoms product of said third distillation column.

4,128,458

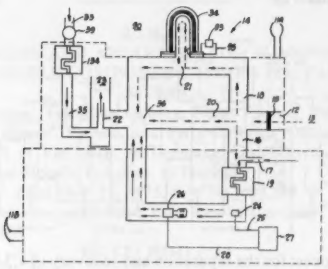
COMBUSTIBLE ELEMENT AND OXYGEN CONCENTRATION SENSOR

Joseph O. Obiaya, 4773 Walford, #13, Warrensville Heights, Ohio 44128

Filed Oct. 25, 1977, Ser. No. 845,049
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **11 Claims**

9. A method for determining the oxygen concentration and combustible element concentration of a sample gaseous fluid comprising the steps of;

a. obtaining a sample of gas to be analyzed;
b. causing said sample to flow through a conduit block heated to a constant ambient level;
c. dividing said sample into first and secpond portions;
d. routing the second portion past an air inlet port in said block and obtaining excess air to be mixed with said second portion;



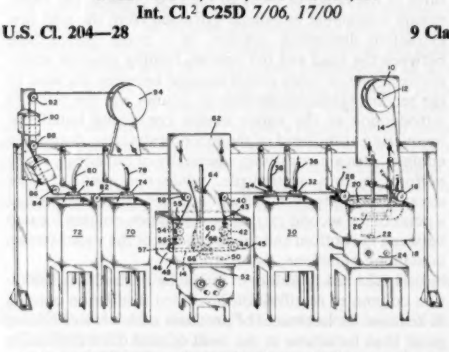
e. routing said second portion and excess air past a combustible analyzer for determining the combustible elememt concentration of said second portion;
f. routing the first portion past an oxygen concentration analyzer for determining the oxygen concentration of said first portion; and
g. recombining said first and second portions downstream from said analyzer and causing them to be ejected from said conduit block from an exhaust port.

4,128,459

CONTINUOUS ELECTROPLATING OF ALLOY ONTO METALLIC STRIP

Gerald R. Bretts, Livingston, and Dirk A. Timan, Morristown both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 25, 1977, Ser. No. 854,557
Int. Cl.[2] C25D *7/06, 17/00*
U.S. Cl. 204—28 **9 Claims**



1. A method for continuously electroplating an alloy on to electrically conductive strip comprising:
(a) placing an anode into a plating bath adjacent to said strip, said bath adapted to electrochemically deposit an alloy therefrom and applying a positive potential to the anode;
(b) transporting the strip submerged through the bath along a mirror symmetrical path having a mirror plane lying normal to the surface of the bath and to the direction of movement of said strip and having the anode generally bisected by said mirror plane, while applying a negative potential through a cathode contacts to the strip at at least two points about equidistant from and on opposite sides of the anode, wherein the anode extends in the direction of movement of the strip not more than about 15% of the length of the strip submerged in the bath so that submerged points of the strip distant from the cathode contact are relatively near to the anode and that the submerged points of the strip near to the cathode contact are correspondingly distant from the anode resulting in an essential uniform potential drop and current density around and along the strip.

4,128,460

COLORING BY ELECTROLYSIS OF ALUMINUM OR ALUMINUM ALLOYS

Hideo Nishimura; Seishi Masaki; Takao Miyauchi, and Nariyoshi Kobayashi, all of Kobe, Japan, assignors to Daiwa Kasei Kenkyujo Kabushiki Kaisha, Kobe, Japan

Filed Sep. 6, 1977, Ser. No. 830,547
Claims priority, application Japan, Sep. 13, 1976, 51-108844; Aug. 2, 1977, 52-92186
Int. Cl.[2] C25D *11/22*
U.S. Cl. 204—35 N **11 Claims**

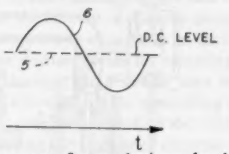
1. A method of coloring aluminum or aluminum alloys by electrolysis which comprises anodizing aluminum or aluminum alloys and electrolyzing the anodized aluminum or alloys without sealing the anodized surface thereof in a bath containing an aliphatic sulfonic acid and a metal salt of said sulfonic acid.

4,128,461

ALUMINUM HARD ANODIZING PROCESS

Moisey Lerner, Brookline; James H. Morse, Holliston, and Mikhael Bessendorf, Brookline, all of Mass., assignors to Sanford Process Corporation, Natick, Mass.

Filed Mar. 27, 1978, Ser. No. 889,933
Int. Cl.[2] C25D *11/08*
U.S. Cl. 204—58 **4 Claims**



1. In an anodizing process for producing a hard coating on aluminum and on alloys of aluminum wherein in the process
(a) the aluminum or aluminum alloy article is immersed in an electrolyte containing an electrooxidating acid and an acidic aqueous extract obtained from the boiling of low grade coal, lignite, or peat, and
(b) a DC voltage is applied between the article and a counter electrode in contact with the electrolyte whereby the article is caused to be at a positive electric potential relative to the counter electrode,
the improvement comprising the steps of
(1) causing the DC voltage to be sinusoidally modulated
(2) raising the DC voltage level during an initial short period to about 10 volts
(3) raising the DC voltage level of the modulated DC voltage at a rate of about ½ volt per minute to a level within the range of 14 to 19 volts,
(4) holding the DC level of the modulated DC voltage substantially constant for a dwell period of about 5 minutes, and
(5) after the dwell period, again gradually raising the DC level of the modulated DC voltage.

4,128,462

ELECTROCHEMICAL PROCESS FOR RECOVERING PRECIOUS METALS FROM THEIR ORES

Hugh A. Ghiringhelli, 436 Danbury Rd., Wilton, Conn. 06897, and Kenneth S. Deffeyes, 40 Western Way, Princeton, N.J. 08540

Filed Aug. 16, 1976, Ser. No. 714,828
Int. Cl.[2] C25C *1/20*
U.S. Cl. 204—109 **5 Claims**

1. In an electrochemical process for recovery of precious

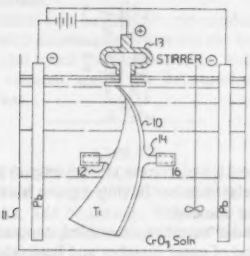
metals from their ores by supplying a slurry of the ore with a cyanide complexing agent for the precious metal and electrolytically processing the slurry to dissolve the precious metal from the slurry and recover the metal by electrodeposition at a cathode, the improvement which comprises adding to the slurry the water soluble electroconductive cationic resin polybenzyltrimethylammoniumchloride, whereby the recovery of precious metals is improved.

4,128,463

METHOD FOR STRIPPING TUNGSTEN CARBIDE FROM TITANIUM OR TITANIUM ALLOY SUBSTRATES

Bert J. Formanik, Willowick, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 2, 1978, Ser. No. 882,636
Int. Cl.[2] C25F *5/00, 3/02*
U.S. Cl. 204—146 **9 Claims**



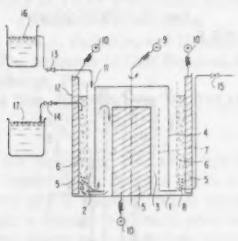
1. A method for electrochemically stripping tungsten carbide from a titanium or titanium alloy substrate in an electrolytic cell which comprises immersing a titanium workpiece having a tungsten carbide coating thereon as an anode in an aqueous solution of chromic acid together with a metallic cathode inert to said aqueous chromic acid solution, imposing a direct current voltage across the anode and cathode in the range of from about 6 to about 50 volts at a current density of from about 4 to about 40 amperes per square foot for a period of at least about 30 minutes at a temperature of at least about 100° F., the concentration of the chromic acid solution being from 4% to 40% by weight.

4,128,464

PROCESS FOR REGENERATING BLEACHING-FIXING SOLUTION

Yoshio Idota, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 25, 1977, Ser. No. 772,032
Claims priority, application Japan, Feb. 25, 1976, 51-19785
Int. Cl.[2] C25C *1/20*
U.S. Cl. 204—151 **10 Claims**



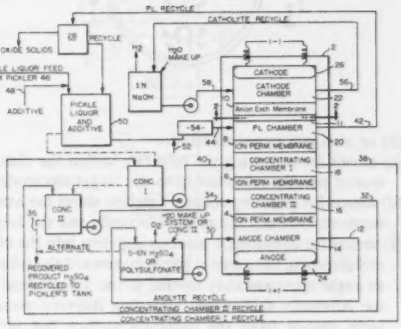
1. A process for electrolytically regenerating a used bleaching-fixing solution resulting from the processing of a color developed color photographic material with a bleaching-fixing solution containing an iron (III) chelate compound and a silver halide solvent in an electrolytic cell comprising anode and cathode compartments separated by a diaphragm wherein the anode is carbon and/or carbon fibers, the cathode potential is −0.40V to −0.55V, the anode potential is 0 to about 0.20V, said potentials being with reference to a standard calomel electrode, and the inter potential is 0.4 to 0.8V; which comprises bubbling an oxygen-containing gas into the anode compartment containing said used bleaching-fixing solution while electrolyzing said used bleaching-fixing solution and; recycling the regenerated solution to a bleach-fixing bath in an electrolytic cell.

4,128,465

ELECTRODIALYSIS OF PICKLE LIQUOR

Richard N. Smith, Monmouth Junction, N.J., assignor to Sybron Corporation, Rochester, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,113
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—180 P **5 Claims**



1. In an electrodialytic process for converting a soluble metal sulfate into an insoluble metal oxide or hydroxides and recovering such from a fluid medium comprising the following steps:

(a) circulating said mixture with an additive between spaced ion permeable membrane;

(b) circulating caustic soda as first electrolyte in the catholyte chamber;

(c) circulating sulfuric acid as second electrolyte in the anode chamber;

(d) passing a direct current through said electrolyte and said mixtures whereby metal sulfate is precipitated as an oxide.

4,128,466

METHOD AND APPARATUS FOR REACTIVE SPUTTERING

Geoffrey L. Harding; David R. McKenzie, and Brian Window, all of Sydney, Australia, assignors to The University of Sydney, Sydney, Australia

Filed Jun. 3, 1977, Ser. No. 803,334
Claims priority, application Australia, Jun. 10, 1976, PC6228
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 C **12 Claims**

1. A process for applying a solar selective surface coating of substantially uniform composition and thickness to a substrate in the form of an elongate tube for use in a solar collector system; the process comprising reactively sputtering atoms from a gaseous impurity and from an elongate metal electrode simultaneously onto the surface of the substrate in a direct current induced plasma, and wherein:

(a) the electrode is disposed parallel to the longitudinal axis of the substrate,

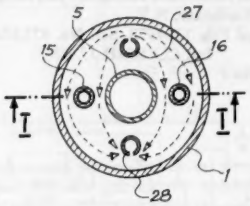
(b) relative rotation about the axis of the substrate is effected between the substrate and the electrode,

(c) the impurity gas is directed towards the substrate surface at an angle approximately normal to the longitudinal axis of the substrate and from delivery points spaced from the substrate surface but uniformly distributed along the length of the substrate, and

(d) flow of the impurity gas is controlled to minimize migration thereof in a direction parallel to the longitudinal axis of the substrate.

10. A direct current reactive sputtering apparatus for use in applying a solar selective surface coating of a substantially uniform composition and thickness to a substrate in the form of an elongate tube for use in a solar collector system, the apparatus including:

(a) an envelope defining a chamber,



(b) an elongate target electrode,

(c) means for mounting the substrate within the chamber in spaced parallel relationship to the target electrode,

(d) means for effecting relative rotation about the axis of the substrate between the target electrode and the substrate,

(e) means for admitting a gaseous impurity into the chamber and directing the gaseous impurity toward the substrate at an angle approximately normal to the longitudinal axis of the substrate, said means including delivery point apertures spaced from the substrate surface but uniformly distributed along the length of the substrate, and

(f) means for controlling the flow of the impurity gas to minimize migration thereof in a direction parallel to the longitudinal axis of the substrate.

4,128,467
METHOD OF ION ETCHING Cd-Hg-Te SEMICONDUCTORS

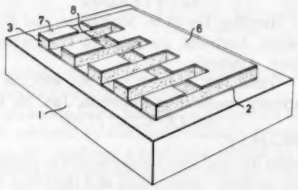
Konrad Fischer, Bad Rappenau, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 24, 1978, Ser. No. 881,007

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1977, 2708792

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 E **8 Claims**



1. A method of ion beam etching in order to structure semiconductor layers, characterized by its use on a semiconductor material comprising cadmium-mercury-telluride.

3. A method as defined in claim 1 and comprising covering the parts of the semiconductor surface which are not to be etched by a material of lower etching rate than said cadmium-mercury-telluride material.

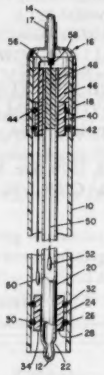
4,128,468
ELECTRODE STRUCTURES

Gary L. Bukamier, 4341 Eureka, Yorba Linda, Calif. 92686

Filed Jan. 3, 1978, Ser. No. 866,283

Int. Cl.² G01N *27/30*

U.S. Cl. 204—195 F **9 Claims**



1. An ion sensitive electrode comprising, in combination:

an outer tubular member having a given inner diameter at a region near one end;

an inner tubular member assembled concentrically within said one end of outer member and having an outer diameter less than said inner diameter such that an annular space remains between said members;

bridging and sealing means for sealing said annular space in the region of one end of the assembled members while permitting ionic transfer across the seal;

the bridging and sealing means comprising an annular plug embracing said inner member and formed of a porous material, said plug having an outer diameter less than the inner diameter of said outer member such that an annular sealing space remains between the plug and said outer member and

said bridging and sealing means further comprising means in the form of a sealing annulus embracing said plug and bearing against the inner wall of said outer member for sealing said space against the passage of liquid.

4,128,469
ELECTROCHEMICAL SENSOR

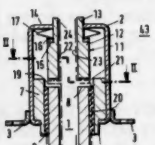
Franz-Josef Rohr, Abtsteinach, and Rudolf Krapf, Leimen, both of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Kafertal, Germany

Filed Jul. 15, 1977, Ser. No. 816,174

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 26322496

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 S **21 Claims**



1. In an electrochemical sensor for determining the oxygen

content in gases, particularly in exhaust gases from burners or internal-combustion engines, having an ion-conducting solid-electrolyte tube supported by a housing with the tube closed on one end and open at the other end for the entry of reference gas to the interior of the tube, an electrode on the inner surface of the tube and an electrode on the outer surface of the tube connected to external leads via contact areas, the combination therewith of

(a) an insulating hollow body surrounding the open end of the solid-electrolyte tube,

(b) a housing around the hollow body and extending above the top of the tube and hollow body,

(c) contact areas disposed on at least one shoulder facing the top of the housing,

(d) conductor strips from the electrodes extending to the shoulder with the upper ends of the conductor strips on the shoulder forming the contact areas,

(e) an insulating structural unit in which the leads are combined, disposed in the housing above the tube and standing on the shoulder,

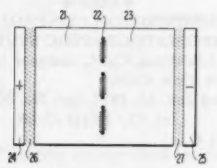
(f) said structural unit having electric conductor, the lower ends of which extend area-wise over the face of the structural unit and touch the contact areas, and

(g) a spring element urging the structural unit against the contact areas.

4,128,470
SUPPORTS FOR ELECTROPHORESIS AND PROCESS FOR THE PRODUCTION OF THE SAME

Nobuo Hiratsuka, and Nakatsugu Yaginuma, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 718,505, Aug. 30, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,421
Claims priority, application Japan, Aug. 29, 1975, 50-104725
Int. Cl.[2] G01N *27/26, 27/28*
U.S. Cl. 204—299 R **9 Claims**



1. A support for electrophoresis comprising a porous polymer film having an electroendosmosis factor of 0 to plus about 10 mm, pore diameter of about 0.1 to 10 microns and voids of not less than 50%.

4,128,471
COAL LIQUEFACTION PROCESS EMPLOYING CARBON MONOXIDE

Huey P. Malone; John A. Paraskos, and Herman Taylor, Jr., all of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

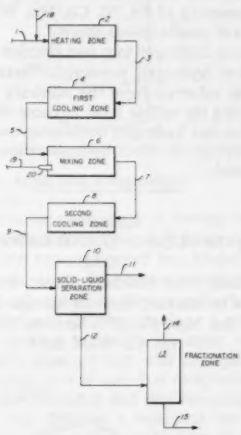
Filed Nov. 30, 1976, Ser. No. 746,183
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—8 **16 Claims**

1. A process for liquefying coal at a hydrogen pressure above 3,100 psi comprising passing a water-containing feed coal-solvent slurry and a gaseous stream containing carbon monoxide through a tubular preheater zone to increase the temperature of the slurry to a maximum temperature in the range from 710° to below 800° F. and to react carbon monoxide with water to produce hydrogen, passing an effluent stream from said preheater zone to a dissolver zone maintained at a temperature which is at least 10° F. higher than the maximum temperature in the preheater zone and which is between about 750° and 900° F., the residence time in the dissolver zone being longer than in the preheater zone, separating a dissolver zone effluent gaseous stream containing carbon oxides and hydrogen from a dissolver zone effluent liquid stream, fractionating said gaseous stream into a carbon monoxide-rich stream and a hydrogen-rich stream, recycling at least a portion of said carbon monoxide-rich stream to said preheater zone, and passing at least a portion of said hydrogen-rich stream and said dissolver zone effluent liquid stream to a catalytic hydrogenation zone maintained at a temperature in the range 700° to 825° F.

4,128,472
SOLVENT DEWAXING PROCESS

Charles W. Harrison, Nederland, Tex., and Paul P. Bozeman, Jr., deceased, late of Groves, Tex. (by Arlene Bozeman, executrix), assignors to Texaco Inc., New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,141
Int. Cl.[2] C10G *43/08*
U.S. Cl. 208—33 **8 Claims**



1. In a continuous solvent dewaxing process wherein an intermediate waxy petroleum distillate oil charge stock is diluted with dewaxing solvent to depress its cloud point and to form an oil/solvent mixture having all wax dissolved therein, wherein the oil-solvent mixture is cooled, in a cooling zone, to a selected separation temperature for precipitating wax crystals and forming a wax/oil/solvent mixture, wherein the precipitated wax is separated from said wax/oil/solvent mixture in a solid-liquid separation zone, forming a solid wax cake and a wax-free oil/solvent mixture, and wherein the wax-free oil/solvent mixture is fractionated, in a fractionation zone to yield a solvent fraction and a dewaxed oil product fraction; the improvement comprising:

(a) cooling, in a first cooling zone, an intermediate waxy petroleum distillate oil stock, having all wax dissolved therein, to a temperature about 5° F. above the cloud point;

(b) mixing, in a mixing zone, under conditions of plug flow radial mixing the waxy oil stock at a temperature about 5° F. above the cloud point with dewaxing solvent at a temperature between about 70° to 100° F. and about 25° to 40° F. below the depressed cloud point in a volume ratio of solvent to waxy oil stock in the range of from about 1:1 to about 5:1 for forming a waxy oil stock/solvent mixture having a temperature about 5°–15° F. below its depressed cloud point such that wax is precipitated therefrom;

(c) cooling, in a second cooling zone, said cooled mixture from step (b) at a uniform cooling rate in the range of from about 1°–8° F./min to a selected temperature in the range of about 0° to 40° F. for precipitating additional wax; and

(d) flowing the cooled mixture from step (c) to said solid-liquid separation zone.

4,128,473

CATALYTIC HYDROTREATING PROCESS

Clarence Karr, Jr., and Kenneth B. McCaskill, both of Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 5, 1977, Ser. No. 857,718
Int. Cl.[2] C07C *5/10;* C10G *23/04;* B01J *35/10*
U.S. Cl. 208—108 **9 Claims**

1. A method for hydrotreating a carbonaceous liquid comprising the steps of:

a. In a reaction zone at a temperature in the range of 300° to 450° C. and at a pressure in the range of 300 to 4000 psig effecting contact of the carbonaceous liquid with a catalytic transition metal sulfide layer disposed on a surface of a hydrogen permeable substrate comprising said transition metal with said transition metal being selected from the group consisting of Fe, Ni, Co, Mo, W, V, Cr, Mn, Cu, Zn, Cd, and combinations thereof.

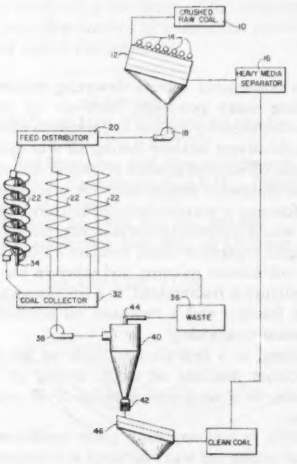
b. Introducing hydrogen into said reaction zone by creating a sufficient hydrogen pressure differential through the permeable substrate from the substrate opposite the surface bearing the sulfide layer to cause diffusion of hydrogen or reactive hydrogen containing species through said metal substrate to effect hydrogenation of said carbonaceous liquid.

4,128,474

PROCESS FOR CLEANING AND DEWATERING FINE COAL

Robert E. Ennis, West Simsbury, Conn., assignor to Linatex Corporation of America, Stafford Springs, Conn.

Filed Mar. 24, 1977, Ser. No. 780,978
Int. Cl.[2] B03B *5/48*
U.S. Cl. 209—2 **12 Claims**



1. A process for the wet concentration of fine coal comprising the steps of providing an aqueous feed slurry of coal and associated contaminate particles, the solids in said feed slurry having a particle size of less than about 10 mm.; feeding at least the portion of said slurry having contaminate particles greater than 0.1 mm. through a spiral gravity concentrator so that as the slurry flows along the spiral under gravity the heavier contaminates having a particle size greater than about 0.1 mm. concentrate in a band separate from at least the portion of the coal slurry having contaminate particles greater than 0.1 mm., and (c); feeding to a hydrocyclone separator at least the portion of the coal slurry containing the coal and the associated contaminate particles of less than 0.1 mm., said hydrocyclone having ascending vortex finder and an underflow discharge port; regulating the discharge from the discharge port to provide controlled accumulation at said port of a coal particle fraction having a particle size greater than about 0.1 mm. while discarding substantially all contaminate particles of less than 0.1 mm. reporting to the ascending vortex finder, discharging the coal fraction accumulated at the discharge port at a substantially higher solids concentration than the slurry entering said hydrocyclone separator and dewatering the coal fraction slurry treated in both said spiral and hydrocyclone separators sufficiently to permit stockpiling of the cleaned coal fraction.

4,128,475

PROCESS FOR BENEFICIATION OF MINERAL VALUES

Samuel S. Wang, Chesire, and Eugene L. Smith, Jr., Milford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 20, 1977, Ser. No. 817,411
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **8 Claims**

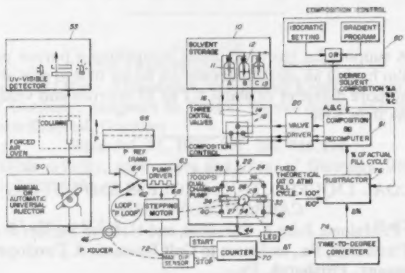
1. In a process of beneficiation of mineral ore by froth flotation in the presence of a collector, the improvement which comprises using as the frothing agent a composition comprising from about 1 to about 99 weight percent of a frothing agent selected from the group consisting of pine oil, creosote, cresylic acid, alcohols, polypropylene glycols and ethers and, correspondingly, from about 99 to about 1 weight percent of an amino-aldehyde resin comprising the alkylated reaction product of an aldehyde and a material selected form the group consisting of urea, melamine, guanamines, ethylene urea, aceylen diureas, pyrimidines, tetrahydropyrimidines, thiourea, carbamates and urethanes.

4,128,476

CARRIER COMPOSITION CONTROL FOR LIQUID CHROMATOGRAPHIC SYSTEMS

John V. Rock, Los Altos, Calif., assignor to Spectra-Physics, Inc., Mountain View, Calif.

Filed Jun. 14, 1977, Ser. No. 806,456
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—31 C **3 Claims**



1. In liquid chromatographic systems, a method for controlling carrier component proportions delivered from a multi-selecting proportioning valve from a plurality of solvent components A, B . . . sequentially delivered to a pump through an inlet valve, said pump having a fill stroke and an output stroke and capable of causing the composition taken in during the fill stroke to be elevated in pressure and delivered through an outlet valve to an LC column for flow therethrough, the steps of

providing a signal indicative of the time of the beginning of the pump fill stroke,

providing a signal indicative of the time of pressure dip at

the outlet of the pump at the head of the column during the beginning of the pump stroke,

computing the time lag between the two signals,

computing a proportioning factor based on said time lag to derive a correction factor signal representing the percentage of lost time during the pump fill stroke,

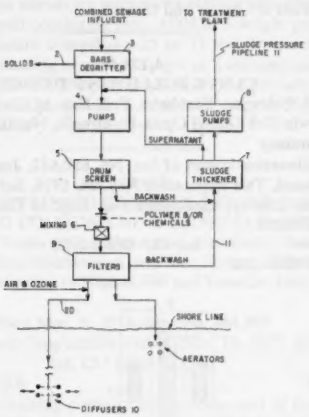
applying said correction factor signal to recompute the valve timing required to achieve demand composition based on the correction, and controlling the valve timing of the proportioning valve by said recomputed valve timing.

4,128,477

METHOD FOR THE TREATMENT OF SEA DISCHARGED SEWAGE

Rostislav Nebolsine, New York, N.Y., assignor to Hydrotechnic Corporation, New York, N.Y.

Filed May 5, 1977, Ser. No. 793,846
Int. Cl.² C02B *1/34*
U.S. Cl. 210—50 **12 Claims**



1. A method of treating sewage fluid for discharge through an outfall to a body of sea water which comprises:

removing dense suspended particulate materials from said fluid;

passing said fluid through a fine mesh screen, which is between 20 and 60 mesh;

introducing a coagulant composition to said fluid to promote coagulation of colloidal size particles in said fluid, said coagulant composition comprising a member selected from the group consisting of an alum composition, a polyelectrolyte, or mixtures thereof;

filtering said fluid containing said coagulated particles through a deep bed multi-media filter to produce a filtrate essentially free of particles between about 1 micron and about 70 microns;

detecting the presence of a lower quantity of oxygen in said filtrate than in the sea-water into which said filtrate is to be discharged by comparing the quantity of dissolved oxygen in said filtrate with the quantity of dissolved oxygen in the sea water;

raising the quantity of dissolved oxygen in said filtrate to at least the level present in said sea-water in response to the detection of said lower quantity of oxygen by blowing an atomized oxygen containing gas under pressure into said filtrate; and

discharging said oxygen treated filtrate to the sea-water through said outfall.

4,128,478

PARTS WASHER

Herman U. Metzger, R.R. 4, Box 18, Goshen, Ind. 46526

Filed Jun. 29, 1976, Ser. No. 700,879
Int. Cl.² B01D *33/18, 29/12*
U.S. Cl. 210—167 **9 Claims**

1. Parts washer apparatus comprising:

a sink with drain;

a first receptacle for washing fluid having an inlet end in fluid communication with the sink drain;

a bag in said first receptacle said bag having an upwardly opening mouth also in fluid communication with the sink drain, the mouth of said bag being sealingly connected to the inlet end of said first receptacle;

a plurality of openings located in the upper portion of said first receptacle adjacent said inlet end and spaced apart from an opposite end of said first receptacle;

a second receptacle around said first receptacle and spaced apart therefrom defining a reservoir for filtered fluid flowing from said first receptacle through said openings;

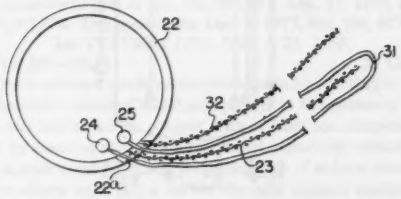
and means for pumping filtered washing fluid from said second receptacle to said sink for washing parts.

4,128,479

BLOOD-GAS EXCHANGER

Paul S. Malchesky, Painesville Township, Lake County, and Yukihiko Nose, Cleveland Heights, both of Ohio, assignors to Japan Foundation For Artificial Organs, Cleveland, Ohio

Continuation of Ser. No. 728,071, Sep. 30, 1976, abandoned. This application Jan. 20, 1978, Ser. No. 871,019
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 B **21 Claims**



1. A blood-gas exchanger unit comprising a central rigid cylindrical core, there being a slot means through said core extending parallel to its axis and along a major portion of the length of said core; a gas inlet and a gas outlet tube each extending longitudinally inside of said core near said slot means

for a major portion of its length and each extending out beyond one end of said core; an elongated lamination consisting serially of (a) a length of inner blood net; (b) a first portion of a length of membrane assembly; (c) a length of sandwiched blood net; and (d) a second portion of said length of membrane assembly; said membrane assembly comprising a continuous length of a flattened membrane tube chosen from diffusion type and microporous type having a continuous opening extending longitudinally thereof and a continuous gas net extending substantially throughout said membrane tube; said membrane being between about 0.0005 inches and about 0.020 inches in thickness and having adequate blood and gas rates of transfer and having biocompatibility; said membrane assembly being folded upon itself midway between its ends and said folded assembly being wrapped firmly around said core with said fold in the outside wrap and sealed in that position with both ends of said membrane in the inside wrap, thus forming a generally spiral coil; opposite ends of said membrane assembly being in communication solely with said gas inlet and gas outlet tubes respectively and sealed thereto; said blood nets and said flattened membrane tube being of the same dimension longitudinally of said unit and said gas net having a slightly smaller dimension conforming to the inside of said flattened membrane tube; a blood inlet cap at one end enclosing said coil except for a blood inlet opening; a blood outlet cap at the opposite end closing said coil except for a blood outlet opening; said caps having peripheral rims snugly fitted to said coil and sealed thereto thus enclosing a spiral blood compartment; said caps spaced from the ends of said spiral coil and there providing blood manifolds; the inside of said inlet cap providing means for dispersing blood evenly and regularly from said blood inlet opening to the adjacent end of said spiral coil; means surrounding said unit and closely limiting its expansion radially; and means rigidly limiting the expansion of said unit longitudinally.

4,128,480

FILTRATION OF LIQUORS

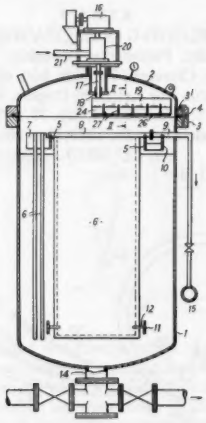
John R. Lumsden, Roxboro, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Continuation of Ser. No. 602,190, Aug. 6, 1975, abandoned. This application Aug. 4, 1977, Ser. No. 821,947

Claims priority, application United Kingdom, Aug. 23, 1974, 37285/74

Int. Cl.[2] B01D *35/16*

U.S. Cl. 210—332 **5 Claims**



1. Filtration apparatus comprising a vertically arranged cylindrical body shell for receiving a supply of liquid under pressure, a liquid inlet in said shell, an array of generally rectangular, stationary planar filter elements, each including two spaced layers of filter material and means for leading off filtrate from an enclosed space defined between said layers, said filter elements being arranged upright and substantially parallel to the axis of the body shell, a spray bar arranged above the array of filter elements and mounted for rotation about the axis of the body shell, said spray bar having a continuous, longitudinally extending, downwardly facing, outlet slit dimensioned to pass over the entire array of filter elements during each complete rotation of the spray bar, means for rotating said spray bar about said axis and means for supplying wash liquor under pressure to said spray bar such as to generate a downward curtain of wash liquor descending from said slit substantially radially of said shell in a direction substantially parallel to the axis of the body shell and moving around said array so as to establish downward streams of wash liquor between said filter elements, such that substantially all portions of the surfaces of said filter elements are sprayed by the rotating slit notwithstanding localized clogging of portions of said slit, said filter elements and said spray bar being mutually disposed for intersection of the curtain of wash liquor with the planes of the surfaces of said filter elements with progressive change in location and angle of intersection as the spray bar rotates such that said streams move progressively along said filter elements, said body shell being provided with means for removing wash liquor from the lower end thereof.

4,128,481

CURVE FOLLOWING DEVICE

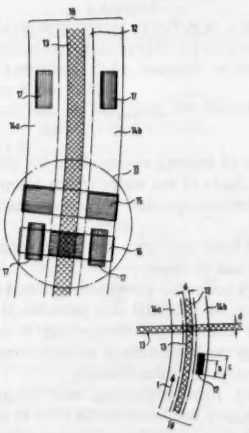
Heinz B. Schreyer, Puchheim, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 650,612, Jan. 20, 1976, abandoned. This application Nov. 24, 1976, Ser. No. 744,810

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1975, 2505296

Int. Cl.[2] G05B *1/00*

U.S. Cl. 250—202 **11 Claims**



1. A curve-following device having an optical sensing head capable of sensing a guide zone containing a guide line having a substantial component transverse to its longitudinal direction and of sensing at least one separate code zone provided adjacent at least one side of said guide line and marks within said code zone, said curve-following device comprising optical scanning means within said head for periodically scanning said guide zone with a certain frequency and for generating signals, means for moving said head along said guide zone at a speed relatively slow in relation to said frequency of the scanning period of said scanning means, a control instrument connectable to said device and having means for receiving said signals

generated by said optical scanning means and for distinguishing between marks arranged within said at least one code zone and said guide line, and means for generating first control signals for controlling said means for moving the sensing head along said guide line, means for tripping second control signals for controlling means other than said moving means, and including means for comparing the length of said marks with said transverse component of the guide line and means for preventing tripping said second control signals unless a mark detected in said code zone exceeds a predetermined length.

4,128,482

MOBILITY CONTROL OF AQUEOUS FLUIDS IN POROUS MEDIA

Robert K. Knight, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Division of Ser. No. 628,534, Nov. 3, 1975, Pat. No. 4,039,028. This application May 20, 1977, Ser. No. 798,920

Int. Cl.[2] E21B *43/22*

U.S. Cl. 252—8.55 D **5 Claims**

1. A waterflooding composition exhibiting a high viscosity and resistance to shear degradation and which retains these properties upon admixture with water-soluble salts comprising an aqueous liquid containing from 0.005 to 5 weight percent of a polymer mixture comprising 25 to 75 weight percent of a heteropolysaccharide produced by genus Xanthomonas and 75 to 25 weight percent of a polyacrylamide or a partially hydrolyzed polyacrylamide having a molecular weight of from 0.5 $\times 10^6$ to 40 $\times 10^6$.

4,128,483

SULFUR-CONTAINING COMPLEX ESTERS AND SPIN FINISHING COMPOSITIONS USING SAID ESTERS

Shiro Ishida, Takarazuka; Genuemon Funatsuki, Amagasaki; Hiromi Izaiku, Nishinomiya, and Jiro Hirano, Takatsuki, all of Japan, assignors to Nippon Oil and Fats Co. Ltd., Tokyo, Japan

Filed Mar. 9, 1978, Ser. No. 884,905

Claims priority, application Japan, Mar. 16, 1977, 52-28085

Int. Cl.[2] D06M *13/26*

U.S. Cl. 252—8.6 **5 Claims**

1. Sulfur-containing complex esters composed of thiodipropionic acid, polyhydric alcohols having at least three valencies and monobasic acids having 5–24 carbon atoms.

4,128,484

FABRIC SOFTENING COMPOSITIONS

Brian D. Barford, Fairfield, and Lawrence Benjamin, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 14, 1975, Ser. No. 595,632

Int. Cl.[2] C09K *3/16*; D06M *13/36*

U.S. Cl. 252—8.8 **16 Claims**

1. A fabric softening composition in the form of an aqueous dispersion, comprising:

(i) from about 3% to about 20% by weight of a disperse phase comprising

(a) at least about 30% by weight of a fatty acid partial ester of a polyhydric alcohol or anhydride thereof containing from 3 to about 8 carbon atoms; and

(b) at least about 5% by weight of a cationic surfactant selected from non-cyclic quaternary ammonium salts having at least one C_{12}–C_{30} alkyl chain, C_8–C_{25} alkyl imidazolinium salts, and C_{12}–C_{20} alkyl pyridinium salts;

the particles of the disperse phase being characterized by an average particle size of less than about 4 microns, said dispersed particles having a positive charge distribution on the surface thereof; and

(ii) the balance of the composition comprising a liquid carrier selected from the group consisting of water and mixtures of water and C_1–C_4 monohydric alcohols.

4,128,485

FABRIC SOFTENING COMPOUNDS

Robert A. Bauman, New Brunswick, and James A. Kaeser, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 714,871, Aug. 16, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 860,034

Int. Cl.[2] D06M *11/04*

U.S. Cl. 252—8.8 **11 Claims**

1. A compound having the formula $[C_nH_{2n}\ {}_1CO_2(CH_2)_m N^+(CH_3)_2C_pH_{2p+1}]X^-$ wherein R is a moiety selected from the group consisting of O and NH and n is an integer of about 11–22 and m is an integer of about 2–6, and p is an integer of 10–20 and X is an anion.

4,128,486

LUBRICANT FOR HIGH TEMPERATURE NUCLEAR SERVICE

David N. Palmer, Tolland, and John E. Davison, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 27, 1977, Ser. No. 762,915

Int. Cl.[2] C10M *1/10, 3/02, 5/02, 7/02*

U.S. Cl. 252—25 **6 Claims**

1. An anti-gall, anti-seize lubricant composition adapted for high temperature service in the presence of neutron radiation comprising finely divide $B^{11}N$ particles dispersed in a carrier.

4,128,487

STABILIZATION OF SODIUM/POTASSIUM SILICATE-CONTAINING COATING BATH

William L. Karpen, Reading, Pa., assignor to Carpenter Technology Corporation, Reading, Pa.

Filed Jan. 9, 1978, Ser. No. 868,113

Int. Cl.[2] C10M *1/10, 3/02, 5/02*; B21B *45/02*

U.S. Cl. 252—28 **7 Claims**

1. The method of stabilizing a coating composition containing an aqueous solution of at least one of sodium and potassium silicate which includes the steps of determining the amount of reactive species introduced into the coating composition during use which are reactive with MOH, M being at least one of sodium and potassium, and then adding to the coating composition an amount of MOH at least substantially equal to the amount thereof required to react stoichiometrically with said amount of reactive species.

4,128,488

OVERBASED PHENOXIDE-HALO CARBOXYLIC ACID CONDENSATE ADDITIVES FOR LUBRICANTS

Thoams F. Steckel, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 608,291, Aug. 27, 1975, Pat. No. 4,061,474. This application Dec. 5, 1977, Ser. No. 857,152

Int. Cl.[2] C10M *1/54, 3/48, 5/28, 7/52*

U.S. Cl. 252—33.6 **23 Claims**

1. An overbased metal carboxylate made by reacting at least one basically reacting metal compound in the presence of a promoter and an acidic reagent with at least one composition made by reacting at least one (I) metal phenoxide substituted with at least one hydrocarbon-based group of at least about 30 carbon atoms with (II) a carboxylic acid reagent containing from 1 to 3 carboxyl-based groups and a halogen-substituted hydrocarbon-based aliphatic or alicyclic group containing a halogen atom.

11. A lubricant composition comprising a major amount of at least one oil of lubricating oil viscosity and a minor amount of the composition claimed in claim 1.

4,128,489

PIEZO-ELECTRIC MATERIAL

Iwao Seo, Inashiki, Japan, assignor to Mitsubishi Petrochemical Company Limited, Marunouchi, Chiyoda, Japan

Filed Dec. 20, 1976, Ser. No. 752,536
Claims priority, application Japan, Dec. 29, 1975, 50-159185
Int. Cl.[2] C04B *35/00*; H01L *41/18*
U.S. Cl. 252—62.9 **9 Claims**

1. Piezo-electric material which comprises a composite of blend polymer resin and piezo-electric ceramic powder, the blend polymer resin consisting of 99 to 20 percent by weight acetal resin and 1 to 80 percent by weight polar polymer said polymer having a relative permittivity above 4.0 and a modulus of elesticity under 8.0×10^9 dyne/cm^2, the blend polymer resin comprising 10 to 90 percent by volume of the composite, the composite being molded and electretized.

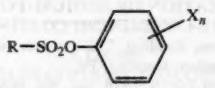
4,128,490

PHENYL SULFONATE ESTERS AS PEROXYGEN ACTIVATORS

Joseph H. Finley, Metuchen, and John H. Blumbergs, Highland Park, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 3, 1977, Ser. No. 838,979
Int. Cl.[2] C11D *3/395, 7/54*
U.S. Cl. 252—95 **14 Claims**

1. A process for the low temperature bleaching of stained and/or soiled fabrics which comprises treating them with an aqueous peroxygen bleaching solution having a pH of about 6 to about 12 and containing as a peroxygen activator therefor, an effective amount of a phenyl sulfonate ester having the formula:



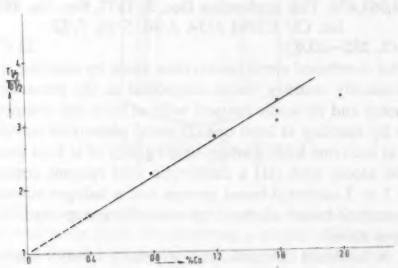
wherein R is selected from the class consisting of a hydrocarbon radical of 1 to 16 carbon atoms and a heterocyclic radical having 1 ring or 2 fused rings, said ring or rings containing 5 to 6 members of which 1 to 2 are heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur; X is hydrogen or at least one electron-withdrawing substituent and n is an integer of from 1 to 5.

4,128,491

SLOW-DISSOLVING PERBORATE

Leo W. A. Melles, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Oct. 27, 1977, Ser. No. 846,085
Claims priority, application United Kingdom, Nov. 1, 1976, 45343/76
Int. Cl.[2] C11D *7/54, 7/56*
U.S. Cl. 252—95 **6 Claims**



1. Particulate alkali metal perborate having a reduced rate of dissolution, especially designed for mixing with detergent granules, the particles of which have an outer layer comprising calcium perborate and calcium metaborate wherein the amount of calcium present is from 0.4% to 2.0% by weight of the total particle.

4,128,492

PROCESS OF PRODUCING A CYCLOHEXANE-1,2,3,4-TETRACARBOXYLIC ACID-CONTAINING SCALE INHIBITOR

Friedrich Krueger, Edingen, and Dieter Palleduhn, Mannheim, both of Fed. Rep. of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,538
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657775
Int. Cl.[2] C02B *5/06*
U.S. Cl. 252—180 **13 Claims**

1. In a process of producing a highly effective agent for inhibiting scale formation is aqueous media, said agent containing cyclohexane-1,2,3,4-tetracarboxylic acid, the steps which comprise

(a) condensing 2 moles of a mixture of acetic acid anhydride and an acetylhalide in the proportion of 0.2:1.8 to 1.8:0.2 with 0.6 moles to 1 mole of crotonaldehyde in the presence of a polymerization inhibiting agent and a condensation catalyst, while stirring and slightly heating the condensation mixture,

(b) adding thereto 0.6 moles to 1 mole of acrylic acid, heating the mixture under reflux to a temperature exceeding 100° C.;

(c) adding to the resulting condensation mixture 0.6 moles to 1 mole of maleic acid anhydride, again heating the mixture to a temperature exceeding 100° C., and

(d) finally adding nitric acid thereto to cause oxidation thereof, said reaction steps being carried out without isolating any of the resulting intermediate products.

4,128,493

COMPOSITIONS USEFUL IN PROCESS FOR EXTRACTION OF METAL VALUES FROM ACIDIC SOLUTIONS

Kenneth D. MacKay, Circle Pines, and Edgar R. Rogier, Minnetonka, both of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Division of Ser. No. 630,600, Nov. 10, 1975, Pat. No. 4,058,585. This application Aug. 8, 1977, Ser. No. 822,765
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—184 **4 Claims**

1. A composition consisting essentially of an essentially water-immiscible organic solvent containing dissolved therein at least about 2% by weight of a quaternary ammonium salt of a hydrogen ion exchange agent wherein the salt has the formula QL where Q is the quaternary ammonium cation of the formula

where R_1 is a hydrocarbon radical of 6 to 24 carbon atoms and R_2, R_3 and R_4 are hydrocarbon radicals of 1 to 24 carbon atoms and L is the deprotonated moiety of anion of the hydrogen ion exchange reagent, L being derived from reagents selected from the group consisting of

(a) an α-hydroxy oxime

(b) a 2-hydroxybenzophenoxime

(c) a βdiketone

(d) a hydroxy containing benzoxazole and

(e) a substituted 8-hydroxyquinoline.

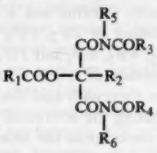
4,128,494

ACTIVATORS FOR PERCOMPOUNDS

Jean-Pierre Schirmann, Oullins; Bernard Dubreux, Francheville le Bas; Michel Bakes, La Celle Saint Cloud; Serge-Yvon Delavarenne, Francheville le Haut, and Marie-Christine Daude-Lagrave, Paris, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Aug. 5, 1977, Ser. No. 822,145
Int. Cl.[2] C11D 3/395, 7/54; D06L 3/02
U.S. Cl. 252—186 7 Claims

1. An activated percompound composition comprising an organic or inorganic percompound and at least one α-acyloxy-N,N'-polyacylmalonamide activator having the formula



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are the same or different and are hydrogen, straight-chain alkyl radicals having from one to eleven carbon atoms, branched chain alkyl or cycloalkyl radicals having from three to twelve carbon atoms, or hydrocarbon radicals with from six to twelve carbon atoms comprising at least one aromatic ring, or where one or both of R_5 and R_6 are COR_7 and R_7 is hydrogen, a straight chain or branched chain alkyl radical with from one to twelve carbon atoms or a hydrocarbon radical with from six to twelve carbon atoms comprising at least one aromatic ring, the activator being in an amount sufficient to increase the activity of the percompound.

4,128,495

BLEACHING COMPOSITION

Joseph E. McCrudden, Warrington, England, assignor to Interox Chemicals Limited, London, England

Filed May 6, 1976, Ser. No. 683,818
Claims priority, application United Kingdom, Nov. 18, 1975, 47371/75
Int. Cl.[2] C11D 3/395, 7/54; D06L 3/02
U.S. Cl. 252—186 17 Claims

1. A solid bleaching or detergent composition comprising a surfactant, a builder salt and a bleaching agent, said bleaching agent comprising phthaloyl peroxide.

12. A process for bleaching which comprises contacting a material to be bleached with an aqueous bleaching composition containing phthaloyl peroxide and a persalt whereby diperoxyphthalic acid is generated in solution.

4,128,496

DICHROIC LIQUID CRYSTAL COMPOSITIONS

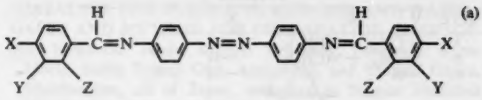
Herbert S. Cole, Jr., Scotia, and Siegfried Aftergut, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 721,670, Sep. 9, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,044
Int. Cl.[2] C09K 3/34; G02F 1/13
U.S. Cl. 252—299 6 Claims

1. A dichroic liquid crystal composition for use in a liquid crystal display comprising:

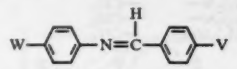
a host liquid crystal material having positive dielectric anisotropy; and

a guest dichroic dye dissolved in said liquid crystal material, said dichroic dye being selected from the group consisting of



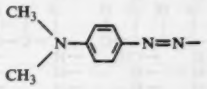
(a)

wherein X is one of a hydrogen atom, a nitro (NO_2) radical and a dimethylamino ($N(CH_3)_2$) radical, and the Y and Z bonds couple to the one of (1) a pair of hydrogen atoms, if X is other than a hydrogen atom, and (2) a fused benzene ring; and

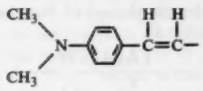


(b)

wherein V is one of a nitro (NO_2) radical and a dimethylamino ($N(CH_3)_2$) radical, and W is one of a dimethylaminophenylazo



radical and a dimethylaminophenylvinyl



radical;

said dichroic liquid crystal composition having an order parameter S of at least 0.70 and a peak absorption wavelength between about 410 nanometers and about 450 nanometers, wherein said host liquid crystal material consists essentially of about 70%, by weight, of p-pentylphenyl-2-chloro-4-(p-pentylbenzoyloxy)benzoate and about 30%, by weight, of an ester mixture composed approximately of 50–60% by weight of 4'-n-pentylphenyl ester of anisic acid, 25–35% by weight of 4'-n-pentylphenyl ester of 4-hexyloxy-benzoic acid, and 10–15% by weight of (2-cyano-4'-butylphenyl) ester of 4-(hexanoyloxybenzoyloxy)-benzoic acid.

4,128,497

DICHROIC LIQUID CRYSTAL COMPOSITIONS

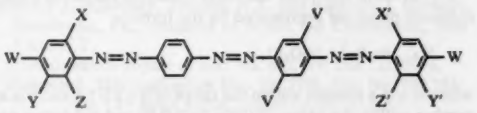
Herbert S. Cole, Jr., Scotia, and Siegfried Aftergut, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 721,668, Sep. 9, 1976, abandoned. This application Jun. 2, 1977, Ser. No. 802,358
Int. Cl.[2] C09K 3/34; G02F 1/13
U.S. Cl. 252—299 2 Claims

1. A dichroic liquid crystal composition for use in a liquid crystal display, comprising:

a host nematic liquid crystal material; and

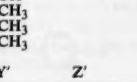
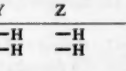
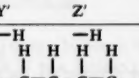
a guest tris-azo dichroic dye dissolved in said nematic liquid crystal material, said dichroic dye having a general chemical formula



wherein the substituents of bonds V, W, X, Y, Z, X', Y', and Z' are coordinately selected from table I

TABLE I

DYE	V	W	X
A	$-CH_3$	$-N(CH_3)_2$	$-H$
B	$-CH_3$	$-N(CH_3)_2$	$-H$
C	$-H$		$-H$
D	$-H$	$-N(CH_3)_2$	$-H$
E	$-H$	$-H$	$-OH$
F	$-H$	$(CH_3)_2N-$	$-CH_3$
G	$-H$	$(CH_3)_2N-$	$-CH_3$
H	$-H$	$(C_2H_5)_2N-$	$-CH_3$

DYE	Y	Z	Y'	Z'	X'
A	$-H$	$-H$	$-H$	$-H$	$-H$
B	$-H$	$-H$			$-OH$
C	$-H$	$-H$	$-H$	$-H$	$-H$
D	$-H$	$-H$	$-H$	$-H$	$-H$
E					$-OH$
F	$-H$	$-CH_3$	$-H$	$-CH_3$	$-CH_3$
G	$-H$	$-H$	$-H$	$-H$	$-CH_3$
H	$-H$	$-H$	$-H$	$-H$	$-CH_3$

for a desired set of an approximate order parameter (S) and an approximate wavelength ($\lambda_{Max.}$) of maximum absorption in accordance with Table II,

TABLE II

DYE	S (approx.)	γ Max.$^{(nm)}$ (approx.)
A	0.7	510
B	0.7	555
C	0.74	505
D	0.72	510
E	0.7	575
F	0.78	550
G	0.78	555
H	0.78	570

the approximate order parameter and approximate absorption wavelength being measured with said dye dissolved in the host material, said host nematic liquid crystal material consisting of a mixture of 70% by weight of p-pentylphenyl-2-chloro-4-(p-pentyl-benzoyloxy)benzoate, and 30% by weight of an ester mixture composed approximately of 50–60% by weight of 4′-n-pentylphenyl ester of anisic acid, 25–35% by weight of 4′-n-pentylphenyl ester of 4-hexyloxybenzoic acid, and 10–15% by weight of (2′-cyano-4′-butylphenyl) ester of 4-(hexanoyloxybenzoyloxy)-benzoic acid.

4,128,498

CHLOROSILICATE PHOSPHOR

Takashi Hase, Ebina; Masatake Yoshikawa, Hiratsuka, and Haruyuki Takanashi, Hatano; all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Mar. 28, 1978, Ser. No. 890,940
Claims priority, application Japan, Mar. 28, 1977, 52-34305
Int. Cl.[2] C09K *11/46*
U.S. Cl. 252—301.4 F **2 Claims**

1. A divalent europium activated strontium beryllium chlorosilicate phosphor represented by the formula

$$Sr_{4-x-y}Be_xEu^{2+}{}_ySi_3O_8Cl_4$$

wherein x is a number within the range of $0 < x \leqq 1.5$ and y is a number within the range of $0.001 \leqq y \leqq 0.50$ and exhibiting an emission peak that is at a shorter wave length than the emission peak of said phosphor without Be.

4,128,499

LEWIS ACID-FLUORINE COMPOUNDS OF CARBON

A. David Cohen, Sarnia, Canada, assignor to Imperial Oil Limited, Toronto, Canada

Continuation-in-part of Ser. No. 523,026, Nov. 12, 1974, abandoned. This application Sep. 22, 1976, Ser. No. 725,417
Int. Cl.[2] B01J *27/12*
U.S. Cl. 252—378 R **17 Claims**

1. A composition of matter consisting essentially of carbon containing in combination therewith fluorine and a Lewis acid selected from the group consisting of BF_3, PF_5, AsF_5, SbF_5, TaF_5, SiF_4, SO_3, PtF_4, NbF_5, VF_5, UF_6 and TiF_4, said composition being in the form of the solid.

13. A process for forming exfoliated graphite comprising contacting graphite with fluorine and a Lewis acid selected from the group consisting of BF_3, PF_5, AsF_5, SbF_5, TaF_5, SiF_4, SO_3, PtF_4, NbF_5, VF_5, UF_6 and TiF_4 for a time sufficient to form a solid composition of matter comprising carbon containing in combination therewith said fluorine and said Lewis acid and thereafter heating the so treated graphite at elevated temperatures so as to decompose the treated graphite thereby exfoliating it.

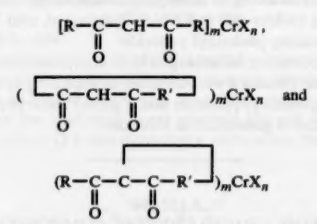
4,128,500

POLYMERIZATION CATALYST AND METHOD

Yu-Tang Hwang, 1520 Ninth St., NW., Clinton, Iowa 52732, and Howard L. Grimmett, 4 Robin Hood Ct., Lincolnshire, Ill. 60015

Filed Apr. 7, 1976, Ser. No. 674,450
Int. Cl.[2] B01J *31/02, 31/12*
U.S. Cl. 252—430 **30 Claims**

1. A catalyst prepared by (1) dispersing on a finely divided, difficultly reducible, inorganic support of the class consisting of silica, alumina, thoria, titania, magnesia and mixtures and composites thereof a non-oxide zirconium compound capable of intimately associating with said support and convertible to the oxide form on calcination, in a stabilizing and promoting proportion, followed by calcining at a temperature within the range of about 400°–2000° F. to provide a zirconium modified support, (2) dispersing on the thusly modified support of (1) a chromium chelate of a beta-dicarbonyl compound essentially of the formula of the class consisting of



wherein each R is individually selected from hydrogen, alkyl, alkenyl, aryl, cycloalkyl and cycloalkenyl radicals and combinations of these radicals with each R containing 0–20 carbon atoms and a corresponding valence-satisfying number of hydrogen atoms, R′ is selected from alkylene, alkenylene, arylene, cycloalkylene and cycloalkenylene radicals and combinations of these bivalent radicals with R′ containing 1–20 carbon atoms and a corresponding valence-satisfying number of hydrogen atoms, m is a whole number from 1 to 3, n is a whole number from 0 to 2 with m plus n being a whole number of 2 to 3 and X is a halide, alkyl or alkoxy, and (3) activating the resulting mixture by heating to and at an elevated temperature of from about 800°–2000° F. in a non-oxidizing atmosphere.

4,128,501

PROCESS FOR THE PREPARATION OF ORGANO-MAGNESIUM COMPLEXES

William N. Smith, Quaker Town, Pa.; Dennis B. Malpass, La-Porte, and Joseph H. Merkley, Dayton, both of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Jun. 24, 1977, Ser. No. 809,750
Int. Cl.[2] C08F *4/50*
U.S. Cl. 252—431 R 4 Claims

1. A process for the preparation of hydrocarbon soluble organo-magnesium complex of the formula

$$(RR'Mg)_m \cdot (R_3Al)_n$$

wherein R is a primary, secondary, or tertiary alkyl group having from 1 to 25 carbon atoms, R' is a primary alkyl group having 1 to 25 carbon atoms, or phenyl group, or mixture thereof, and m and n are numbers such that the ratio of m/n is about one or greater comprising:

(a) reacting magnesium metal with primary alkyl halide or phenyl halide of the formula R'X wherein R' is as defined and X is chlorine, bromine or iodine at a temperature between about 20° C. and about 200° C., said magnesium being present in an amount from 1 to 2 moles of magnesium per mole of halide; and

(b) adding thereto a metal organo-aluminate compound of the formula R_4AlM wherein R is as defined and M is sodium, potassium or lithium in less than a 1:1 mole ratio with the magnesium reaction compounds of step a).

4,128,502

ETHYLENE POLYMERIZATION CATALYST

Nicholas K. Kildahl, Worcester, Mass., and Peter Fotis, Highland, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 755,862, Dec. 30, 1976, abandoned. This application Dec. 2, 1977, Ser. No. 856,862
Int. Cl.[2] C08F *4/10, 4/64*
U.S. Cl. 252—431 R 10 Claims

1. A catalyst for polymerizing ethylene or ethylene containing a small amount of polymerizable C_3 to C_8 olefin comprising:

(a) a solid catalyst component made from (1) a lower alkyl magnesium alkoxide or magnesium hydroxide, (2) a liquid titanium-aluminum compound which is the reaction product of aluminum chloride and a lower alkyl titanium (IV) alkoxide reacted at a temperature ranging from about 0° to about 150° C. in a mol ratio, said aluminum chloride to said alkoxide, between one-third to one and about two to one, and (3) a lower alkyl alkylaluminum dichloride, wherein (1) and (2) are reacted at a temperature ranging from about 0° to about 150° C. in amounts such that the molar ratio of elemental magnesium to elemental titanium ranges from about 0.5 to about 5, and wherein the product of the reaction of (1) and (2) is reacted with (3) at a temperature ranging from about −20° to about 150° C., the concentration of (3) ranging from about 1 to about 10 mols per mol of (1) employed; and

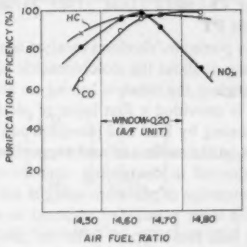
(b) a lower alkyl trialkylaluminum promoter in an amount which is effective to increase the activity of (a).

4,128,503

CATALYST FOR PURIFYING EXHAUST AND WASTE GASES AND METHOD FOR PREPARATION THEREOF

Shin Yamauchi, Ikeda; Kiyoshi Yonehara, Takatsuki; Koshi Horie, Suita; Tetsuji Ono, Amagasaki, and Takashi Ohara, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed Mar. 30, 1977, Ser. No. 782,759
Claims priority, application Japan, Mar. 31, 1976, 51/34342; May 19, 1976, 51/56657
Int. Cl.[2] B01J *27/14, 31/02;* C01B *25/00*
U.S. Cl. 252—435 16 Claims



1. A catalyst for purifying exhaust and waste gases which is capable of simultaneously removing nitrogen oxides, carbon monoxide and hydrocarbons from the exhaust gases at high efficiencies consisting essentially of 2 to 50 g of phosphorus, 2 to 50 g of barium, 0 to 30 g of nickel, as oxide 0.05 to 3 g of at least one member selected from the group consisting of palladium and platinum and 0.005 to 0.3 g of rhodium in elemental form, calculated as atom, supported on an inert carrier per liter of a final catalyst.

4,128,504

STABILIZED ZINC-CONTAINING ZEOLITES

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, and Edwin N. Givens, Pitman, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 329,800, Feb. 5, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,949
Int. Cl.[2] B01J *29/06*
U.S. Cl. 252—455 Z 24 Claims

1. A method for preventing elution of zinc from a zinc-containing zeolite catalyst by incorporating therein an elution preventing amount of another metal selected from the group consisting of metals of Group IB or VIII of the Periodic Table, germanium, rhenium and rare earth metals, the zeolite used having a silica to alumina ratio of at least about 12 and a constraint index of from about 1 to about 12.

15. A zeolite catalyst comprising of a zeolite characterized by having a silica to alumina mole ratio of at least 12 and a constraint index of from about 1 to about 12 and containing from about 0.1% to about 5% by weight of zinc and from about 0.1% to about 2% by weight of another metal selected from a group of metals of Groups IB and VIII of the Periodic Table, germanium, rhenium and rare earth metals.

4,128,505

CATALYST FOR HYDROTREATING

Richard J. Mikovsky, Trenton, N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 642,957, Dec. 22, 1975, abandoned. This application Dec. 15, 1976, Ser. No. 750,754
Int. Cl.[2] B01J *21/04, 21/06, 23/84, 27/04*
U.S. Cl. 252—465 14 Claims

1. A catalyst composition, the catalyst support of which consists essentially of co-precipitated titania and zirconia, the

co-precipitate having associated therewith a mixture of (1) cobalt metal, cobalt oxide or cobalt sulfide and (2) molybdenum oxide or molybdenum sulfide.

4,128,506

PLATINUM-RHODIUM CATALYST FOR AUTOMOTIVE EMISSION CONTROL

Louis Hegedus, Grosse Pointe Woods, and Jack C. Summers, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 23, 1978, Ser. No. 871,706
Int. Cl.[2] B01J *21/04, 23/42, 23/46*
U.S. Cl. 252—466 PT **3 Claims**

1. A three-way platinum/rhodium catalyst adapted for use in a system operating at about the stoichiometric air/fuel ratio of an automotive engine, the catalyst having an alumina support on which there is provided a first layer of platinum which is resistant to poisoning by lead and phosphorous, said platinum being positioned on the surface of said support and penetrating into the body thereof in decreasing concentration with the maximum concentration of platinum being at the surface of the support, a second layer positioned adjacent to said first layer and penetrating into said support with the greater portion of rhodium positioned in said second layer beneath said first layer, rhodium being also present in said first layer with its minimum concentration in said first layer being at or close to said surface and increasing in concentration to a maximum, the depth at said maximum rhodium concentration defining the boundary between said first and second layers, the concentrations of platinum and rhodium decreasing inwardly from said boundary, said first layer of platinum serving to protect the rhodium in said second layer from poisoning and the total amount of rhodium on said catalyst being as low as about 0.002% by weight.

4,128,507

PERFUMED GELS OF HYDROXYPROPYL CELLULOSE

Bernard M. Mitzner, New Hampton, N.Y., assignor to Polak's Frutal Works, Inc., Middletown, N.Y.

Filed Feb. 28, 1977, Ser. No. 773,098
Int. Cl.[2] C11B *900*
U.S. Cl. 252—522 **4 Claims**

1. A perfumed gel suitable for use as a room freshener consisting essentially of about 3 to 10% by weight of hydroxypropyl cellulose dissolved in about 90 to 97% of a solution consisting essentially of about 35 to 90% of a linear polyol plasticizer for hydroxypropyl cellulose, 10 to 55% perfume oil and 0 to 10% of a hydroxypropyl cellulose solvent selected from the class consisting of water and 1 to 3 carbon aliphatic ahcohols.

4,128,508

COLOR CHANGE PERFUME SYSTEMS

David R. Munden, Hythe, England, assignor to International Octrooimaatschappij "Octropa" BV, Rotterdam, Netherlands

Filed Jun. 22, 1977, Ser. No. 808,737
Claims priority, application United Kingdom, Jul. 2, 1976, 27683/76
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 **16 Claims**

1. A colour change perfume system comprising (1) a volatile acid or base, (2) a perfume adapted to pass into the atmosphere at a selected rate, and (3) a pH indicator, the volatile acid or base being selected and being present in such amount as to volatize at about the same rate as the perfume, thereby causing the pH indicator to change colour when the perfume is effectively exhausted.

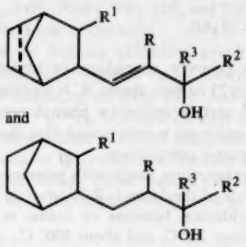
4,128,509

1-(NORBORN-5'-EN-2'-YL) OR 1-(NORBORN-2'-YL) SUBSTITUTED 1-ALKEN-3-OLS AND ALKAN-3-OLS

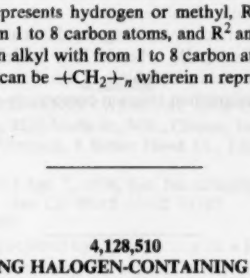
Alfred A. Schleppnik, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 211,788, Dec. 23, 1971, abandoned. This application Nov. 29, 1974, Ser. No. 528,124
Int. Cl.[2] C07C *35/22;* A61K *7/46*
U.S. Cl. 252—522 **18 Claims**

1. A compound characterized by the formulae



and



wherein R^1 represents hydrogen or methyl, R represents an alkyl with from 1 to 8 carbon atoms, and R^2 and R^3 represent hydrogen or an alkyl with from 1 to 8 carbon atoms, provided that R and R^2 can be $+CH_2+_n$ wherein n represents the integer 2, 3 or 4.

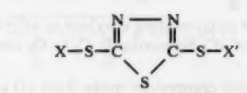
4,128,510

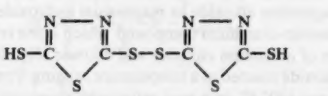
VULCANIZING HALOGEN-CONTAINING POLYMERS

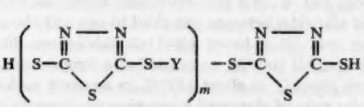
John R. Richwine, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 18, 1977, Ser. No. 788,395
Claims priority, application United Kingdom, Jun. 28, 1976, 26832/76
Int. Cl.[2] C08F *28/00;* C08G *59/00, 59/14;* C08K *5/47*
U.S. Cl. 528—36 **19 Claims**

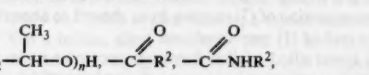
1. The process of crosslinking a halogen-containing polymer which consists essentially of heating said polymer in the presence of a basic material and a derivative of 2,5-dimercapto-1,3,4-thiadiazole selected from those derivatives having one of the following formulas:







wherein X is a substituent selected from hydrogen, —CR-R'OH, $-(CH_2-CH_2-O)_nH$,



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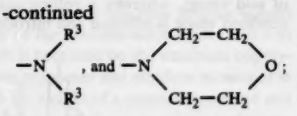
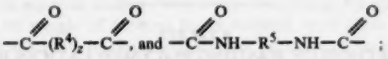


where n is an integer from 1 to 5, R and R′ are selected from hydrogen, alkyl groups containing 1–8 carbon atoms, and aryl, alkaryl and aralkyl groups containing 6 to 8 carbon atoms; R^2 is selected from alkyl groups containing 1–17 carbon atoms, aryl groups containing one to two rings, alkaryl groups containing 7–14 carbon atoms, aralkyl groups containing 7–8 carbon atoms and cyclohexyl groups; R^3 is an alkyl group containing 1–8 carbon atoms; X′ is the same as X with the exception of hydrogen; m is an integer from 1 to 10; and Y is selected from zinc, lead, —CRR′—, —CO—, —S—,

—SO_2—, —SS—,



where R^4 is selected from alkylene and alkenylene groups containing 1–8 carbon atoms and cycloalkylene, arylene and alkarylene groups containing 6–8 carbon atoms; z is 0 or 1; and R^5 is selected from alkylene groups containing 2–8 carbon atoms, phenylene, methylphenylene and methylenediphenylene.

4,128,511

WATER-SOLUBLE, CROSSLINKED NITROGENOUS CONDENSATION PRODUCTS PRODUCED BY REACTION OF CHLOROHYDRIN-ETHERS WITH ETHYLENEIMINE

Werner Streit, Bobenheim; Rolf Fikentscher; Karl Gans, both of Ludwigshafen, and Gerhard Welzel, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen a. Rhein, Fed. Rep. of Germany

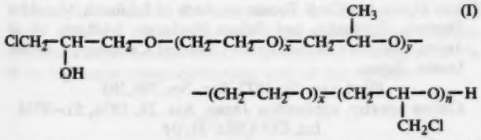
Filed Aug. 3, 1977, Ser. No. 821,549

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1976, 2638955

Int. Cl.² C08L *63/00*

U.S. Cl. 528—424 **3 Claims**

1. A water-soluble, crosslinked nitrogen-containing condensation product, the viscosity of which, in aqueous solution, increases with increasing temperature, obtained by reacting a chlorohydrin-ether of the formula



(I)

where x is from 50 to 250, y is from 20 to 100, the ratio x:y is from 6.1:1 to 1:15 and n is from 0.5 to 5, with ethyleneimine in the weight ratio of from 1:0.1 to 1:0.8.

4,128,512

POST TREATMENT OF FLEXIBLE POLYURETHANE FOAM WITH ORGANIC SILOXANES FOR INCREASING THE WATER ABSORBENCY AND PENETRATION

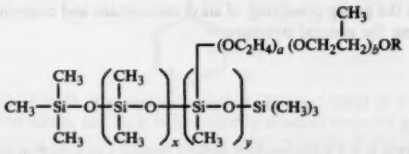
Keith G. Spitler, Bethel Park, and David A. Radovich, Coraopolis, all of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Oct. 26, 1977, Ser. No. 845,690

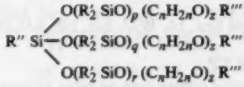
Int. Cl.² C08J *9/00*; C08G *18/44*

U.S. Cl. 521—55 **4 Claims**

1. A method of increasing the water absorbency and penetration of a flexible polyurethane foam comprising washing and/or impregnating said foam with an aqueous solution of siloxane wherein said siloxane is selected from the group consisting of (A)



wherein R represents a methyl, ethyl, propyl or butyl group, wherein the silicone chain has an average molecular weight of from about 140 to about 5000, wherein the polyether chain has an average molecular weight of from about 60 to about 3000, wherein x and y are each integers of 1 or more, and wherein a and b can be 0 or whole numbers, but one of them must be at least 1; and (B) compounds of the formula



wherein R′, R″, and R‴ are alkyl radicals having from 1 to 4 carbon atoms, p, q or r each have a value of from 4 to 8, and $(C_nH_{2n}O)_z$ is a mixed polyoxyethylene oxypropylene group containing from 15 to 19 oxyethylene units and from 11 to 15 oxypropylene units with z equal to from about 26 to about 34.

4,128,513

SORBENT FOAM MATERIAL

Louis A. Errede, North Oaks, and Robert A. Sinclair, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 13, 1974, Ser. No. 469,102

Claims priority, application United Kingdom, May 25, 1973, 25181/73

Int. Cl.² C08J *9/16*; C08G *73/00*

U.S. Cl. 521—50 **10 Claims**

1. A black sorbent thermoset foam which has been prepared by the pyrolysis of a composition liquid at the pyrolysis temperature comprising sulfuric acid and at least one aromatic nitrogen-containing compound having the general formula:

X — Ar — Y

in which Ar represents an aromatic nucleus, X represents a substituent having a negative Hammett sigma constant and attached by a nitrogen, oxygen or sulphur atom, and Y represents a substituent having a positive Hammett sigma constant and attached by a nitrogen atom, the substituents X and/or Y forming part of a ring fused onto the aromatic nucleus or attached directly to the aromatic nucleus, the thermoset foam having a specific surface area of at least 50 m^2/g, and said pyrolysis comprising heating said composition to a temperature below 300° C. to initiate reaction of the said composition.

4,128,514
STABLE POLYCHLOROPRENE LATEX

Kenneth D. Fitzgerald, Sugarland, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Filed Jan. 9, 1978, Ser. No. 868,192
Int. Cl.[2] C08L *11/02*
U.S. Cl. 260—17 A 22 Claims

1. A process for preparing latex compositions comprising polymerizing a carboxylic acid soap-free aqueous suspension of chloroprene monomer containing about 0.5 to 5.0 parts by weight of an alpha, beta unsaturated carboxylic acid monomer based on the total weight of monomer, in the presence of (a) 2 to 6 parts by weight of a protective colloid containing 0.1 to 6 parts by weight hydroxyalkyl cellulose and from 0 to 2.9 parts by weight of polyvinyl alcohol and (b) 0.5 to 2 parts by weight of an organic sulfur containing chain transfer agent selected from the group consisting of alkyl mercaptans and compounds having the general structure:

$$R-O-\overset{\overset{S}{\|}}{C}-(S)_n-\overset{\overset{S}{\|}}{C}-O-R$$

wherein R is a hydrocarbon radical having 1 to 8 carbon atoms and n is 2 to 6, (a) and (b) being in parts by weight based on 100 parts of monomer.

4,128,515
WATER REDUCIBLE EPOXY ESTERS AND COATING COMPOSITIONS CONTAINING THEM

Michael A. Tobias, Bridgewater, and Carlos J. Martinez, Edison, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,195
Int. Cl.[2] C08G *59/14*
U.S. Cl. 260—18 EP 27 Claims

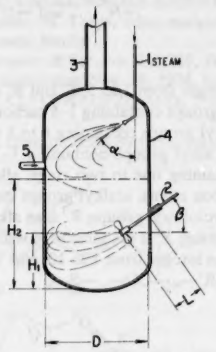
1. An epoxy ester comprising an ester adduct of at least one polyfunctional epoxy resin containing more than one 1,2-epoxy group with a dicarboxylic acid, in a ratio of dicarboxylic acid equivalents to epoxide equivalents of from 1.20 to 1.50, wherein said ester adduct has an acid number of between about 20 and about 40.

4,128,516
PROCESS FOR THE GENTLE DEGASIFICATION OF COAGULATION-SENSITIVE PVC LATICES

Hans Geschonke, Pulheim; Rainer Rompeltien, and Wolfgang Rummel, both of Cologne, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jul. 7, 1977, Ser. No. 813,663
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722952
Int. Cl.[2] C08L *27/06*
U.S. Cl. 260—29.6 R 11 Claims

1. In the process for the gentle degasification of coagulation-sensitive PVC latices in a confined space under reduced pressure and stirring at elevated temperatures with steam injection onto the latex surface, the improvement consisting essentially of conducting said degasification at a selected temperature from 50° C. to 80° C. at a pressure corresponding to the boiling pressure of water at the selected temperature, stirring said latex by an inclined stirrer mounted in a perpendicular plane to the vessel wall and inclined from the vertical by an angle β of 20° to 45° in a clockwise direction, said inclined stirrer extending beyond the wall of said vessel by the length L said latex surface being between a minimum height H_1, and a maximum height H_2 in said vessel having a diameter D, where the ratio of L to D is from 0.3 to 0.1, the ratio of the lower limit of H_1 is $0.3 > H_1$ to $D > 0.1$, the ratio of the upper limit H_2 is $1 > H_2$ to $D > 0.2$, said stirrer being situated so that effective stirring occurs at H_1 and H_2 is at about 50% of the total liquid capacity of said vessel, whereby a rolling action of said latex in said confined space is effected and introducing said steam into the

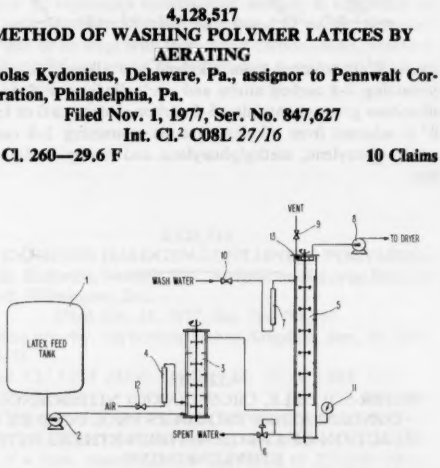


gas space above said latex but directed along the surface of the confined space.

4,128,517
METHOD OF WASHING POLYMER LATICES BY AERATING

Nicholas Kydonieus, Delaware, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 1, 1977, Ser. No. 847,627
Int. Cl.[2] C08L *27/16*
U.S. Cl. 260—29.6 F 10 Claims



1. In the method of reducing contaminants in an aqueous polymer suspension wherein said suspension is washed with water to remove contaminants the improvement which comprises aerating said suspension prior to washing to produce a foam wherein the suspended polymer particles have a reduced apparaent density, and then washing the foamed suspension product by passing it in counter-current relationships with wash water.

4,128,518
PRESSURE-SENSITIVE ADHESIVE AND VINYL ACETATE-ETHYLENE COPOLYMER EMULSION USEFUL AS BASE MATERIAL THEREFOR

Takeo Oyamada; Choji Tomizawa, both of Ichihara; Masahiro Domoto, Toyonaka, and Shizuo Narisawa, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 20, 1977, Ser. No. 789,293
Claims priority, application Japan, Apr. 28, 1976, 51-48734
Int. Cl.[2] C08L *23/04*
U.S. Cl. 260—29.6 WB 6 Claims

1. A pressure-sensitive adhesive containing a base material therefor comprising an aqueous emulsion of vinyl acetate-ethylene copolymer having an ethylene content of 20 to 35% by

weight, the benzene-insoluble part of less than 20% by weight and an intrinsic viscosity of the benzene-soluble part of 0.6 to 1.0 dl/g (at 30° C.) which is prepared by the emulsion copolymerization of vinyl acetate monomer and ethylene monomer in the presence of 0.1 to 1% by weight of a protective colloid and 1 to 8% by weight of a polyoxyethylenic nonionic surfactant, based on the total weight of the monomers, at a temperature of 30-60° C. and under a pressure of 30 to 100 kg/cm^2, wherein at least 50% by weight of the vinyl acetate monomer is added uniformly and continuously to the emulsion polymerization system during the emulsion polymerization.

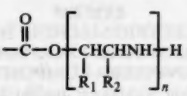
4,128,519

AQUEOUS VINYLIDENE FLUORIDE POLYMER COATING COMPOSITION

Edward J. Bartoszek, Norristown, and Alkis Christofas, Levittown, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 21, 1977, Ser. No. 761,191
Int. Cl.^{2} C08L *27/16*
U.S. Cl. 260—29.6 NR **6 Claims**

1. An aqueous coating composition comprising, for each 100 parts by weight of aqueous liquid medium, from about 25 to about 125 parts of dispersed polymer particles of vinylidene fluoride homopolymer or copolymer of at least 50 mol percent vinylidene fluoride copolymerized with at least one other copolymerizable monomer and from about 3 to about 50 parts of emulsified liquid epoxy resin, and, for each part by weight of liquid epoxy resin, from about 0.25 to about 2.5 parts of an emulsifying agent comprising an acidified aminoalkylated polymer having pendant aminoalkylate groups of the formula



wherein R_1 and R_2 are independantly selected from the group consisting of hydrogen and lower alkyl radicals having 1 to 4 carbon atoms and the average value of n ranges from about 1.0 to 2.5, and wherein said aminoalkylated polymer before aminoalkylation contains at least 3% by weight pendant-COOH groups.

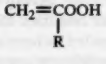
4,128,520

THICKENING BUTADIENE-STYRENE LATICES WITH TERPOLYMER EMULSIONS

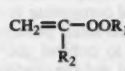
Eugene S. Barabas, Watchung; Andrew Klein, Somerville, and Dru W. Alwani, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Feb. 18, 1977, Ser. No. 770,197
Int. Cl.^{2} C08L *9/08*
U.S. Cl. 260—29.7 W **9 Claims**

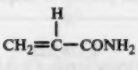
1. A method for thickening butadiene-styrene latices which comprises adding thereto a terpolymer emulsion prepared by inducing in a reactor, at a temperature of from about 5° C. to about 80° C., a redox-initiated polymerization in an aqueous dispersion of, as monomers (1) from about 30 to about 85 wt.% of an α,β-unsaturated carboxylic acid of the formula



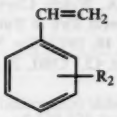
(2) from about 5 to about 50 wt.% of an ester of an α,β-unsaturated carboxylic acid of the formula



and (3) from about 0.5 to about 20 wt.% of an amide of an α,β-unsaturated acid of the formula



or an unsaturated aromatic hydrocarbon of the formula



in which each R is methyl or ethyl, R_1 is an alkyl of 1 to 8 carbon atoms, and R_2 is independently selected from the group consisting of hydrogen, methyl or ethyl; wherein all the ingredients necessary for polymerization are present in the reactor upon initiation of polymerization.

4,128,521

BAKING FINISHES OF LOW SOLVENT CONTENT

Ruprecht Kroker, Bobenheim, Roxheim, and Hans Sander, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,715
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635117
Int. Cl.^{2} C09D *3/58, 3/81*
U.S. Cl. 260—31.4 R **7 Claims**

1. A baking finish of low solvent content consisting essentially of (A) an acrylate resin, (B) an epoxy resin, and (C) a mixture of organic solvents, wherein the acrylate resin (A) is a copolymer containing from 10 to 35% by weight of α,β-olefinically unsaturated carboxylic acid as copolymerized units and having a K value (measured by the Fikentscher method) of less than 15 and an acid number of from 70 to 250 mg of KOH/g; the epoxy resin (B) contains at least 2 oxirane groups per molecule, and the organic solvent mixture (C) is a mixture of from 30 to 70% by weight of an aromatic hydrocarbon mixture having a boiling range of from 150° to 270° C., a dielectric constant of from 2 to 4.99 and containing more than 80% by weight of aromatics with from 70 to 30% by weight of one or more alcohols having a boiling point range of from 80° to 200° C. and a dielectric constant of from 5 to 27, or a mixture of said alcohol or alcohols with at least one compound boiling at from 80° to 200° C. and selected from the group consisting of glycol monoalkyl ether and glycol monoalkyl acetate, the weight of the components (A):(B) being from 9:1 to 6:4 and the weight ratio of the components (A+B):(C) being from 7:3 to 5:5.

4,128,522

METHOD AND MASKANT COMPOSITION FOR PREVENTING THE DEPOSITION OF A COATING ON A SUBSTRATE

Richard C. Elam, Manchester, Conn., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Jul. 30, 1976, Ser. No. 710,060
Int. Cl.^{2} C08K *3/08*
U.S. Cl. 260—32.8 R **16 Claims**

1. A maskant composition for use in preventing the deposition of a coating on a predetermined portion of a substrate, said composition comprising:

a solids portion including a reduceable material capable of

reacting with and being reduced by said coating, said reduceable material comprising in excess of at least about 8% by weight of said solids portion; and an inhibitor in an amount sufficient to control the reaction between the reduceable material and the coating wherein said amount sufficient comprises an amount up to about 92% by weight of said solids portion; and

a binder vehicle including a resinous material and a solvent in which the solids portion is suspended.

4,128,523

POLYETHYLENE-EDPM COMPOSITIONS

James E. Britton, Akron; Fredric D. Metcalf, Rootstown; John G. Sommer, Hudson; Tiong H. Kuan; Victor R. Rilling, both of Akron, and John A. Welch, Cuyahoga Falls, all of Ohio, assignors to The General Tire & Rubber Co., Akron, Ohio

Filed Aug. 18, 1977, Ser. No. 825,615

Int. Cl.[2] C08L *23/16*

U.S. Cl. 260—33.6 AQ **28 Claims**

1. A curable processable composition comprising a blend of an ethylene-propylene-diene rubbery polymer (EPDM) having a raw Mooney viscosity ML (1+4) at 250° F. of from about 25 to 100, a crystallinity at room temperature without stretching of from about 1.5 to 16%, and an ethylene content of at least about 65 mole %, and crystalline solid polyethylene (PE) having an average weight of from about 6,000 to 15,000, said crystalline polyethylene being used in an amount of from about 5 to 110 parts by weight per 100 parts by weight of said ethylene-propylene-diene polymer.

4,128,524

COMPOSITES OF METAL-MODIFIED UREA-MELAMINE-FORMALDEHYDE RESINS AND FILLERS

David L. Barnett, Washington Boro; Peter A. Christie, and Lewis W. Eckert, both of Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 6, 1976, Ser. No. 712,293

Int. Cl.[2] C08K *3/22, 3/36*

U.S. Cl. 260—39 R **22 Claims**

1. A composite molded product comprising the pressure molded and cured product produced by the process comprising:

(a) uniformly blending about 80 to about 60% by weight of expanded perlite particles with an aqueous solution of about 20 to 40% by weight of a thermosetting Group IVB metal-modified urea-melamine-formaldehyde resin to produce a composite mixture, whereafter said composite mixture is directly charged into a mold;

(b) molding the composite mixture in said mold under a pressure of about 9 to 14 kg/cm^2 to produce a molding; and

(c) curing the molding at a temperature of about 65° to 95° C. to produce the composite molded product to thereby thermoset the same.

4,128,525

THERMOPLASTIC ADHESIVES

Ernest L. Yeakey, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Continuation-in-part of Ser. No. 528,458, Nov. 29, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,873

Int. Cl.[2] C08L *77/00, 63/00*; C08K *5/36*

U.S. Cl. 260—29.1 R **8 Claims**

1. An improved thermoplastic adhesive formulation comprising a plasticizer, compatible with a polyamide polymer, said polyamide polymer comprising:

a resinous polyamide reaction product having a molecular weight less than about 10,000 and being prepared from a polyoxypropylene polyamine selected from the group consisting of diamines, triamines and mixtures thereof, and having an average molecular weight of about 200 to about 3,000, piperazine and an aliphatic or aromatic dicarboxylic acid, ester or anhydride having about 4 to about 20 carbon atoms per molecule.

4,128,526

COPOLYESTERS OF POLY(ALKYLENE GLYCOL AROMATIC ACID ESTERS) AND DIESTERS COMPRISING AROMATIC DIOLS

Willem F. H. Borman, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

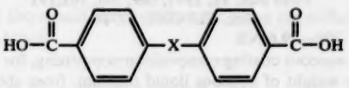
Filed Dec. 23, 1976, Ser. No. 753,862

Int. Cl.[2] C08G *63/18*

U.S. Cl. 260—40 R **10 Claims**

1. A thermoplastic copolyester prepared by heating at from 150° C. to 280° C. and a pressure of from 0.1 to 20 mm Hg. and reacting:

(a) (i) a dicarboxylic acid selected from one or more of the group consisting of terephthalic acid, isophthalic acid, naphthalene dicarboxylic acids, phenyl indane dicarboxylic acid and compounds of the formula:



in which X is alkylene of from 1 to 4 carbon atoms, carbonyl, sulfonyl, oxygen or a bond between the benzene rings and

(ii) one or more straight chain, branched chain or cyclic aliphatic diols of from 2 to 10 carbon atoms or

(iii) a polyester prepared by heating (i) and (ii); and

(b) a di-ester of an aromatic diol of from 6 to 30 carbon atoms.

4,128,527

DYNAMOELECTRIC MACHINE HAVING COIL WINDINGS AND CORE ENCAPSULATED WITH RESIN-FILLER COMPOSITION

Noriyuki Kinjo; Akio Nishikawa; Junichi Katagiri, all of Hitachi; Hitoshi Yokono, Katsuta; Tamotsu Ikeda, Hitachi, and Tsuguo Kobayashi, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 13, 1977, Ser. No. 787,098

Claims priority, application Japan, May 12, 1976, 51-53194

Int. Cl.[2] C08K *7/14*

U.S. Cl. 260—42.18 **17 Claims**

1. A dynamoelectric machine comprising a stator assembly including coil windings and a core encapsulated with a heat-dissipating, electro-insulative housing, a rotor assembly including a shaft centrally disposed thereto, and a bearing assembly disposed to the stator assembly, for rotatably supporting the shaft, wherein the housing is made of a cured resin-filler composition comprising:

(I) a liquid unsaturated polyester resin containing an ethylenically unsaturated compound monomer and a curing catalyst, which has a viscosity of from 50 to 50,000 centipoises at 25° C.; and

(II) an inorganic, electro-insulative filler consisting essentially of

(a) a calcium carbonate powder having a particle size corresponding to that of particles which can pass a 325 mesh sieve,

(b) an inorganic mineral particulate having a particle size corresponding to that of particles which can pass a 12 mesh sieve and is retained on a 200 mesh sieve, and

(c) a chopped glass fiber having a length larger than 200 μm and a diameter less than 150 μm after the composition has been kneaded, wherein the ratios by weight of the respective ingredients are as follows:

(a)/(b) = 0.3 to 4, (c)/total weight of the composition = 0.05 to 0.25,

(I)/total weight of the composition = 0.1 to 0.4, and
(II)/total weight of the composition = 0.6 to 0.9.

4,128,528

CLAY-POLYMER CONCENTRATES FOR BENEFICIATING CLAYS

Alvin J. Frisque, La Grange, Ill., and Arthur R. McDermott, Houston, Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 577,588, May 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 486,553, Jul. 8, 1974, abandoned. This application Aug. 1, 1977, Ser. No. 820,676

Int. Cl.[2] C09K *7/02*

U.S. Cl. 260—42.55 **3 Claims**

1. A homogeneous clay-acrylamide polymer composition which comprises:

A. a dry clay powder; and

B. from 0.1 to 40% by weight based on the weight of (A) of a water-in-oil emulsion of a finely divided water soluble acrylamide polymer, said water-in-oil emulsion of a water soluble acrylamide polymer comprising:

a. 30–95% of an aqueous phase consisting of water and water soluble acrylamide polymer having a particle size ranging between 2 millimicrons up to about 5 microns,

b. 10–50% of the water soluble acrylamide polymer, said water soluble acrylamide polymer containing at least 5% by weight acrylamide and having a molecular weight in excess of one million,

c. 5–70% of an organic hydrophobic liquid,

d. 0.1–21% by weight of a water-in-oil emulsifying agent;

said clay acrylamide polymer composition being characterized as being in the form of a homogeneous free-flowing powder to a damp powder and is prepared by adding (B) to (A).

4,128,529

INDUSTRIAL BIOCIDE

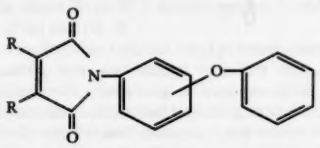
Frank C. Becker, Gurnee; Jorge P. Li, Libertyville, and John W. Williams, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 8, 1977, Ser. No. 785,905

Int. Cl.[2] C08K *5/34;* **C09D** *5/14;* **D06M** *13/40*

U.S. Cl. 260—45.8 NB **6 Claims**

4. The method of protecting a film-forming polymeric composition or a synthetic or cellulosic fabric against bacterial or fungal attack upon extended storage or exposure environments including common bacteria or fungi, comprising adding to said composition or fabric between 0.005 and 5.0% by weight of a maleimide of the formula



I

wherein both substituents R and H or Cl.

4,128,530

MERCAPTO PHENOLIC AND ALKYLTHIO PHENOLIC ANTIOXIDANTS

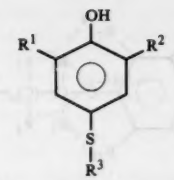
Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 25, 1974, Ser. No. 436,751

Int. Cl.[2] C08K *5/36*

U.S. Cl. 260—45.95 C **2 Claims**

1. An oxidizable polymer susceptible to oxidation degradation having incorporated therein a phenolic compound having the following structural formula:



wherein R^1 is selected from the group consisting of hydrogen and α-phenyl ethyl, R^2 is α-phenyl ethyl and R^3 is selected from the group consisting of α-phenyl ethyl and β-phenyl ethyl.

4,128,531

THERMOSETTING RESIN COMPOSITION

Shinichi Toyoda, Katsuta; Masahiko Sakai; Kazuo Goto, both of Hitachi; Toshikazu Narahara, Tokaimura, and Yoshiharu Karasawa, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Oct. 18, 1977, Ser. No. 843,205

Claims priority, application Japan, Oct. 30, 1976, 51-131417

Int. Cl.[2] C08L *63/00*

U.S. Cl. 528—53 **8 Claims**

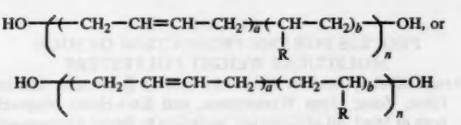
1. A thermosetting resin composition comprising

(a) one or more polyfunctional epoxy compounds,

(b) one or more polyfunctional isocyanates,

(c) one or more curing agents, and

(d) at least one polymer of butadiene having terminal hydroxyl groups represented by the formula:



wherein R is hydrogen, alkyl, alkenyl, nitrilo, or phenyl; $a \geqq 0.7$, $b \leqq 0.3$, and $a + b = 1$; and n is an integer which determines the molecular weight of the polymer of butadiene in the range of from 500 to 5,000.

4,128,532

POLYETHERESTERS WHICH CONTAIN HYDROXYL GROUPS AND THE USE THEREOF IN THE PRODUCTION OF FLAME RESISTANT SYNTHETIC RESINS

Erich Eimers; Rolf Dhein, both of Krefeld-Bockum, and Rolf Wiedermann, Bergisch-Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 620,724, Oct. 8, 1975, abandoned. This application Nov. 21, 1977, Ser. No. 853,616

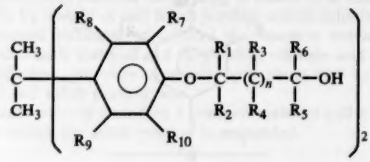
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1974, 2450539

Int. Cl.[2] C08G *63/66, 63/68*

U.S. Cl. 528—79 **9 Claims**

1. A liquid polyetherester which contains hydroxyl groups and has an acid number of from 0 to 5, a hydroxyl number of from 100 to 300 and a viscosity of from 10 to 200 poises at 25° C. obtained by the esterification of:

(a) a bis-hydroxyalkyl ether of halogenated 2,2-diphenylolpropane corresponding to the general formula:



wherein

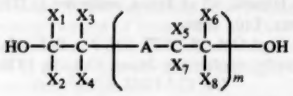
$n = 0$ or 1;

R_1 through R_6 may be the same or different and represent H, or C_1–C_4 alkyl; and

R_7 through R_{10} may be the same or different and represent H, C_1–C_4 alkyl or halogen, at least one of the groups R_7–R_{10} being a halogen atom; and

(b) a polycarboxylic acid selected from the group consisting of saturated, unsaturated, aromatic polycarboxylic acids and mixtures thereof;

(c) in the presence of an excess of a dihydric alcohol corresponding to the following formula:



wherein

X_1 through X_8 are the same or different and represent H, or C_1–C_4 alkyl;

m = 1–10, and

A represents O or S, and the reaction temperature is from 120° C. to 200° C.

4,128,533

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYESTERS

Armin Köhler; Herbert Pelousek, both of Dormagen; Helmut Ohse, Zons; Hans Westermann, and Karl-Heinz Magosch, both of Marl, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Faserwerke Huls Gesellschaft mit beschrankter Haftung, Marl, both of, Germany

Filed Aug. 17, 1977, Ser. No. 825,421

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637813

Int. Cl.[2] C08G *63/14*

U.S. Cl. 528—279 **8 Claims**

1. A process for the production of a high molecular weight polyester, which comprises reacting a dicarboxylic acid or derivative thereof with a diol in the presence of a combination consisting essentially of compounds of manganese, magnesium, titanium and antimony as a catalyst.

4,128,534

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYESTERS

Armin Köhler; Herbert Pelousek, both of Dormagen; Helmut Ohse, Zons; Hans Westermann, and Karl-Heinz Magosch, both of Marl, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Faserwerke Huls Gesellschaft mit beschrankter Haftung, Marl, both of, Germany

Filed Aug. 17, 1977, Ser. No. 825,422

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637814

Int. Cl.[2] C08G *63/14*

U.S. Cl. 528—279 **8 Claims**

1. A process for the production of a high molecular weight polyester by reacting a dicarboxylic acid or a derivative thereof with a diol in the presence of a catalyst comprising a combination of compounds of manganese, magnesium and titanium.

4,128,535

METHOD FOR REDUCING COLOR FORMATION IN POLYESTERS

Melvin C. Baker, Youngstown, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 19, 1977, Ser. No. 834,829

Int. Cl.[2] C08G *63/16*

U.S. Cl. 528—272 **3 Claims**

1. In the preparation of a polyester wherein adipic acid, glutaric acid or succinic acid or mixtures thereof; ethylene glycol, propylene glycol or mixtures thereof; and 1,4-butanediol are brought together under conditions suitable for condensation polymerization, a method for reducing undesirable color formation in the polyester product, the method consisting essentially of first forming a reaction mass of the acid and the glycol and then adding the butanediol to the reaction mass after the reaction between the acid and the glycol is practically complete.

4,128,536

CYANO-OLIGOMER COMPOSITIONS AND PROCESSES THEREOF

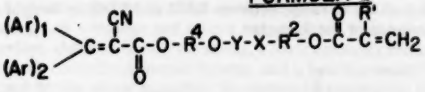
Lee Brodsky, Parsippany; Donald H. Lorenz, Basking Ridge; Suzanne B. Nelsen, Bergenfield, and Shu T. Tu, E. Brunswick, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,666

Int. Cl.[2] C08G *18/00*

U.S. Cl. 427—54 **32 Claims**

FORMULA I



1. A cyano-oligomer of Formula I wherein

$(Ar)_1$ and $(Ar)_2$ are aromatic carbocyclic nuclei of the benzene series and are independently selected from the group consisting of phenyl, alkyl phenyl, halo phenyl, carboxamido phenyl, sulfonamido phenyl, carbalkoxy phenyl, cyano phenyl, acetyl phenyl, benzoyl phenyl, phenyl substituted phenyl and alkyl phenyl substituted phenyl;

R^1 is hydrogen or methyl;

R^2 is lower alkylene;

R^4 is lower alkylene;

X is oxygen or nitrogen; and

Y is a urethane radical.

4,128,537
PROCESS FOR PREPARING ETHYLENICALLY UNSATURATED ISOCYANURATES

Kenneth H. Markiewitz, Wilmington, Del., assignor ICI Americas Inc. Wilmington, Del.

Filed Jul. 27, 1977, Ser. No. 819,352
Int. Cl.[2] C08G *18/00*
U.S. Cl. 528—49 **31 Claims**

1. A process for preparing an ethylenically unsaturated isocyanurate which comprises reacting a polyisocyanate with a monohydric alcohol which contains a vinylidene group and which does not contain an allyl group, in the presence of a copper salt to form an isocyanate-containing urethane, wherein the amounts of monohydric alcohol and polyisocyanate are selected to furnish after said reaction from 0.75 to 1.6 moles of unreacted isocyanate groups per mole of polyisocyanate used, then adding a catalytic amount of an isocyanate trimerization catalyst which will initiate trimerization of the isocyanate-containing urethane without causing gellation, and trimerizing the isocyanate-containing urethane to form an ethylenically unsaturated isocyanurate.

4,128,538
CROSSLINKING POLYMERIC DYE MORDANT COMPOSITION REACTION PRODUCT OF BISALKANE OR BISARENE SULFONATE AND VINYL POLYMER

Arnold M. Burness; Hans G. Ling, both of Rochester, and Glen M. Doppen, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 412,992, Nov. 5, 1973, Pat. No. 3,859,096. This application Sep. 24, 1974, Ser. No. 508,771
Int. Cl.[2] C08G *69/48*
U.S. Cl. 260—884 **13 Claims**

1. A dye mordant composition comprising the reaction product of from 0.1 to 20 weight percent based on the total weight of (a) and (b) of:

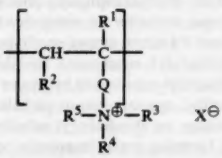
(a) a bisalkane or bisarene sulfonate, vinyl polymer crosslinking agent having the formula:

$$R{-}SO_3{-}CH_2{-}Y{-}CH_2{-}O{-}SO_2{-}R$$

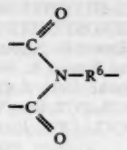
wherein R is alkyl or aryl and Y is selected from the group consisting of unsaturated alkylene, arylene, pyridine diyl and furan diyl;

and from about 80 to 99.9 weight percent based on the total weight of (a) and (b) of

(b) a cross-linkable resinous vinyl polymer comprised of first repeating units and second repeating units, said first repeating units comprising at least one-third of said vinyl polymer and said second repeating units being from ethylenically unsaturated monomers and comprising from 0 to 66.67 weight percent of said polymer and said first repeating units being represented by the formula:



wherein R^1 is hydrogen or alkyl and Q is selected from the group consisting of the atoms which when taken together with R^2 form a

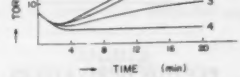


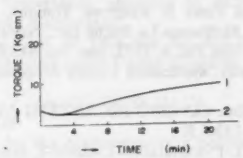
group, wherein R^2 is an alkylene radical, R^3, R^4 and R^5 are alkyl, aryl or aralkyl groups and those atoms which when taken together with R^3 and R^4 are the nitrogen atom to which they are attached form a quaternized nitrogen-containing heterocyclic ring, R^6 is alkylene, and $X-$ is an anion, said polymer being substantially free of carboxyl groups.

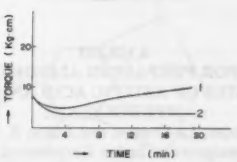
4,128,539
CURABLE VINYL CHLORIDE RESIN COMPOSITION

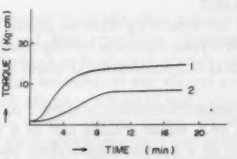
Masao Onizawa, Ohmiya, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,444
Claims priority, application Japan, Dec. 25, 1976, 51/155654; Mar. 14, 1977, 52/26957
Int. Cl.[2] C08F *8/32, 8/34*
U.S. Cl. 260—4 R **9 Claims**









1. A curable composition comprising a vinyl chloride resin and lysine as a sole curing agent.

4. A curable composition comprising a vinyl chloride resin, at least one amino acid selected from the group consisting of lysine, ornithine, arginine and proline, and at least one sulfur compound selected from the group consisting of sulfur and sulfur donors.

4,128,540

PYROGLUTAMYL-HISTIDYL-TRYPTOPHANYL-SERYL-TYROSYL HYDRAZIDES

Mildred C. Rebstock; Ernest D. Nicolaides; Thomas F. Mick; Francis J. Tinney, and Eugene L. Wittle, all of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed May 25, 1972, Ser. No. 257,000

Int. Cl.[2] C07C *103/52*

U.S. Cl. 260—112.5 R 4 Claims

1. A peptide hydrazide compound represented by the formula

pGlu-His-Trp-Ser-R_1($NHNH_2$)

where R_1 represents a member of the class consisting of Tyr, Tyr-Gly, and Tyr-Gly-Leu.

4,128,541

PENTAPEPTIDE WITH MORPHINE- LIKE ACTIVITY

Dimitrios Sarantakis, West Chester, and Norman H. Grant, Wynnewood, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,794

Int. Cl.[2] C07C *103/52;* H61K *37/00*

U.S. Cl. 260—112.5 R 1 Claim

1. A pentapeptide of the fomula: H—Tyr—Gly—Gly—Phe—Ser—OH or a non-toxic salt thereof.

4,128,542

PEPTIDE DERIVATIVES

Frank R. Atherton, Welwyn Garden City; Michael J. Hall, Welwyn; Cedric H. Hassall, Welwyn; Robert W. Lambert, Welwyn, and Peter S. Ringrose, Harston, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 5, 1977, Ser. No. 813,066

Claims priority, application United Kingdom, Jul. 13, 1976, 29102/76

Int. Cl.[2] C07C *103/52;* C07G *7/00*

U.S. Cl. 260—112.5 R 4 Claims

2. (1R)-1-(L-Pyroglutamyl-L-alanyl-L-alanylamino)-ethylphosphonic acid.

4,128,543

PROCESS FOR PREPARING ALCOHOL SOLUBLE CONDENSATES OF ABIETIC ACID AND A PROTEIN HYDROLYSATE

Vernon L. Johnsen, La Grange, and Elaine S. Stern, Evanston, both of Ill., assignors to Inolex Corporation, Chicago, Ill.

Filed Jan. 24, 1977, Ser. No. 761,668

Int. Cl.[2] A23J *1/10;* C07G *7/00*

U.S. Cl. 260—123.7 13 Claims

1. A process for separating from an abietic acid condensate of a protein hydrolysate a portion having complete solubility in absolute alcohol at a concentration of about 2 percent comprising:

acidifying an aqueous solution of about 5 to about 25 percent by weight of a water soluble salt of a condensate with abietic acid of a protein hydrolysate having an average molecular weight in the range of about 300 to about 600 from a pH above about 6 to a pH in the range of about 3.5 to about 5 to precipitate a portion of the condensate while leaving another portion thereof in solution; and

separating and drying the precipitated portion of the condensate from the acidified aqueous solution as a product of the process.

4,128,544

COPPER COMPLEXES OF SUBSTITUTED SULFOPHENYL-AZO-PHENYL-AZO-NAPHTHALENE SULFONIC ACIDS CONTAINING A HETEROCYCLIC FIBER-REACTIVE GROUP

Lukas Schneider, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

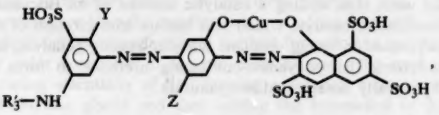
Continuation of Ser. No. 582,072, May 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 279,356, Aug. 10, 1972, abandoned. This application Oct. 20, 1976, Ser. No. 734,277

Claims priority, application Switzerland, Aug. 16, 1971, 11998/71

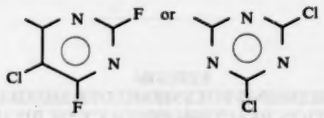
Int. Cl.[2] C09B *45/28, 62/08, 62/24;* D06P *1/382*

U.S. Cl. 260—146 T 9 Claims

1. A compound of the formula



wherein R_3' is



Y is methyl, methoxy or methoxyethoxy, and Z is hydrogen, methyl or methoxy.

4,128,545

AZO DYES WITH 2,6-DIAMINO-PYRIDINE COUPLING COMPONENT

Johannes Dehnert, and Gunther Lamm, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Dec. 19, 1973, Ser. No. 426,370

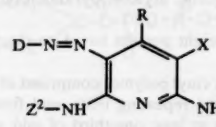
The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1972, 2263458

Int. Cl.[2] C09B *29/36;* D06P *1/18, 3/26, 3/72*

U.S. Cl. 260—156 10 Claims

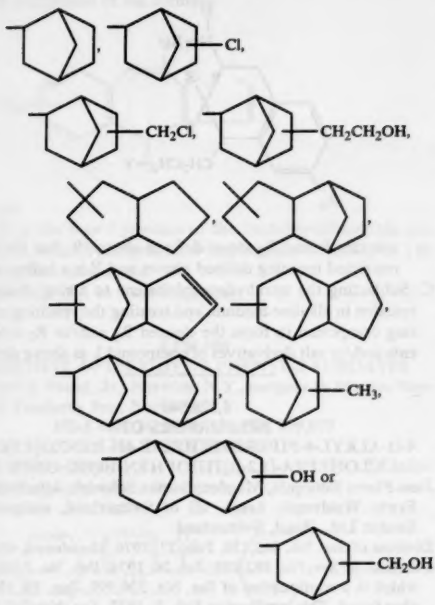
1. A dye of the formula



where D is phenyl substituted by chlorine, bromine, trifluoromethyl, methyl, methoxy, nitro, cyano, methylsulfonyl, ethylsulfonyl, phenylsulfonyl, carbalkoxy of a total 2 to 5 carbon atoms, carbo-β-alkoxyethoxy, said alkoxy having 1 to 4 carbon atoms, or N,N-dialkyl-substituted sulfamoyl, said alkyl having 1 to 3 carbon atoms; phenylazophenyl; phenylazophenyl substituted by chlorine, bromine or nitro; benzthiazolyl; benzthiazolyl substituted by nitro, cyano, methylsulfonyl or ethylsulfonyl; benzisothiazolyl substituted by chlorine, bromine, cyano or nitro; thiazolyl substituted by cyano or nitro; thienyl substituted by methyl, cyano, nitro or carbalkoxy of a total of 2 to 5 carbon atoms; or thiadiazolyl substituted by phenyl, methyl, chlorine, bromine, methylmercapto, ethylmercapto or alkoxycarbonylethylmercapto, said alkoxy having 1 to 4 carbon atoms;

R is alkyl of 1 to 3 carbon atoms;

X is carbamoyl or cyano; one of the radicals Z^1 and Z^2 is



and the other is hydrogen; alkyl of one to six carbon atoms, alkyl of two to six carbon atoms substituted by hydroxy, OCHO, $OCOCH_3$, cyano, methoxy, ethoxy, phenoxy, phenoxy, phenoxyethoxy, benzyloxy or phenyl; cyclohexyl; phenyl; β-hydroxy-β-phenylethyl, or $(CH_2)_3(OC_2H_4)_nOT$; and

T is alkyl of one to four carbon atoms, phenyl or benzyl; and *n* is 1 or 2.

4,128,546

PROCESS FOR THE PURIFICATION OF FR-1923 SUBSTANCE

Masaru Kurita, Takatsuki; Kazuyoshi Jomon, Kawanishi; Tadaaki Komori, Takatsuki; Isami Nakatani, Hata, and Masahiro Tsuji, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 562,928, Mar. 28, 1975, abandoned. This application Jun. 10, 1976, Ser. No. 694,906

Int. Cl.[2] C07D *205/08*

U.S. Cl. 260—239 A **7 Claims**

1. A process for treating impure FR-1923 substance to remove undesired components which comprises the steps of contacting an aqueous solution thereof at a pH of 4 – 8 with a macroporous nonionic adsorption resin selected from styrene-divinylbenzene copolymer and acrylic ester polymer, said resin having an average pore diameter of 4 to 100 nm and a surface from 100 to 1000 m^2 per gram, until said resin is saturated by FR-1923 substance, and thereafter contacting further aqueous solution of FR-1923 substance containing impurities at a pH of about 4 – 8 with said saturated resin to adsorb at least some of said second impurities, and recovering said further FR-1923 substance from the passed through solution.

4,128,547

6-(D-α-AMINO-P-HYDROXYPHENYLACETAMIDO)-PENICILLANIC ACID PREPARATION

Johannes K. van der Drift, Delft; Peter W. Henniger, Leiden, and Gerard J. van Veen, Pijnacker, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

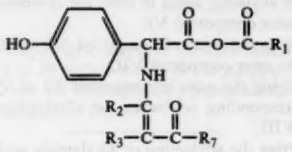
Filed Nov. 25, 1977, Ser. No. 854,821

Claims priority, application Japan, Oct. 31, 1977, 52-130694; Netherlands, Sep. 6, 1977, 7709812

Int. Cl.[2] C07D *499/12, 499/04*

U.S. Cl. 260—239.1 **8 Claims**

1. A process for the preparation of amoxicillin comprising reacting 6-aminopenicillanic acid with at least two equivalents of a silylating agent producing trimethylsilyl groups in an anhydrous, inert, water-insoluble organic solvent and reacting the resulting product at a temperature below −25° C. with an at least equimolar amount of a compound of the formula



wherein R_1 and R_7 are lower alkoxy, R_2 is lower alkyl and R_3 is selected from the group consisting of lower alkyl and hydrogen previously prepared from the corresponding Dane salt and an acid chloride under anhydrous conditions in the presence of a tertiary amine in an inert, water-insoluble organic solvent.

4,128,548

PROCESS FOR PREPARING 6,7-BENZOMORPHANS

Antony M. Akkerman, and Geertruida C. van Leeuwen, both of Amsterdam, Netherlands, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

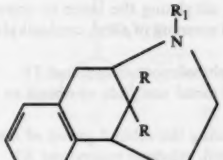
Filed Feb. 17, 1976, Ser. No. 658,739

Claims priority, application United Kingdom, Feb. 25, 1975, 7891/75

Int. Cl.[2] C07D *221/26*

U.S. Cl. 542—429 **6 Claims**

1. A process for the preparation of a benzomorphan compound of the formula

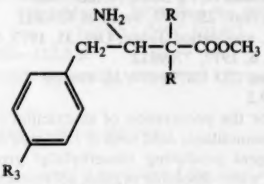


I

in which R is selected from the class consisting of methyl or ethyl; R_1 is selected from the class consisting of hydrogen atom, alkyl, haloalkyl and alkenyl groups containing up to seven carbon atoms, haloalkenyl and alkinyl groups containing up to four carbon atoms, cycloalkyl and cycloalkenyl groups containing up to seven carbon atoms, cycloalkylalkyl, cycloalkenylalkyl, cycloalkylidenealkyl and aralkyl groups containing up to nine carbon atoms, heteroarylalkyl compounds containing one oxygen atom and up to seven carbon atoms or heterocycloalkylalkyl groups containing one or two oxygen atoms and up to seven carbon atoms; and R_2 is selected from the class consisting of hydrogen atom, hydroxy groups, alkoxy groups containing up to three carbon atoms, alkoxyalkoxy groups containing up to four carbon atoms, nicotinoyloxy groups, lower alkanoyloxy groups, phenylalkanoyloxy groups

containing up to nine carbon atoms or alkylaroyloxy groups containing up to nine carbon atoms; and pharmaceutically acceptable salts thereof; which comprises:

A. Reacting an aminoacid ester compound of the formula



V

wherein R is as defined above, and R_3 is hydrogen or lower alkoxy,

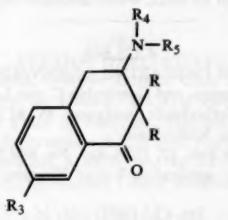
(1) with an acylating agent to form the corresponding acylamino ester compound VI;

(2) alkylating the ester of compound VI to obtain the alkylamido ester compound VII;

(3) saponifying the ester of compound VI or VII to obtain the corresponding acylamino or alkylamido acid compound VIII;

(4) converting the acylamino or alkylamido acid compound VIII to an amidoacyl chloride compound IX;

(5) converting the amidoacyl chloride compound IX by a Friedel-Crafts ring closure reaction to form a naphthalenone compund of the formula



IV

wherein R and R_3 are as defined above; R_4 is an acyl group; and R_5 is hydrogen alkyl, cycloalkyl or cycloalkylalkyl;

(a) in the event that R_5 is hydrogen in the naphthalenone compound IV, alkylating the latter to convert R_5 to the more restricted meaning of alkyl, cycloalkyl or cycloalkylalkyl;

B. Reacting the naphthalenone compound IV

(1) with an alkali metal acetylide to obtain an alcohol, ethinyl compound X;

(2) partially reducing the ethinyl group of compound X to obtain an alcohol, ethylene compound XI;

(3) isomerizing compound XI to obtain an hydroxy ethylidene compound XII;

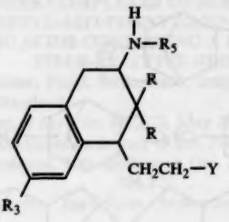
(4) (a) converting the hydroxy ethylidene compound XII by reduction to an hydroxy ethyl compound XIII and deacylating compound XIII to form an aminoalcohol compound XVI; or

(b) (1) converting the hydroxy ethylidene compound XII to a tetrahydropyranyl ether compound XIV, reducing the compound XIV to compound XV and deacylating compound XV, followed by hydrolysis to form an aminoalcohol compound XVI; or

(2) converting the compound XV by acid hydrolysis to compound XIII and deacylating compound XIII to an aminoalcohol compound XVI; or

(c) deacylating and reducing compound XII to form an aminoalcohol compound XVI; and

(5) converting the aminoalcohol compound XVI to a tetrahydronaphthalene compound having the formula



XVII

wherein R and R_3 are as defined above, R_5 has the more restricted meaning defined above, and Y is a halogen; and

C. Subjecting the tetrahydronaphthalene to a ring closure in reaction in alkaline medium and treating the resulting closed ring compound to form the desired R_1 and/or R_2 substituents and/or salt derivatives of compound I, as above defined.

4,128,549

PRECURSORS OF 4-(1-ALKYL-4-PIPERIDYLIDENE-4H-BENZO[4,5]CYCLOHEPTA-[1,2-B]THIOPHEN-10(9H)-ONES

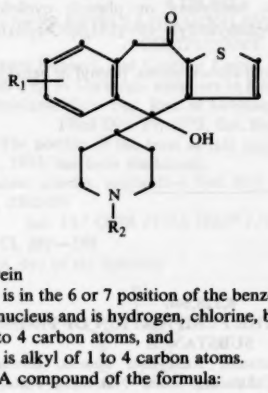
Jean-Pierre Bourquin, Magden; Gustav Schwarb, Allschwil, and Erwin Waldvogel, Aesch, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 662,124, Feb. 27, 1976, abandoned, which is a division of Ser. No. 492,008, Jul. 26, 1974, Pat. No. 3,960,894, which is a continuation of Ser. No. 324,999, Jan. 19, 1973, abandoned. This application Feb. 3, 1977, Ser. No. 765,231

Int. Cl.[2] **C07D** *409/02, 333/80*

U.S. Cl. 546—202 **11 Claims**

1. A compound of the formula:

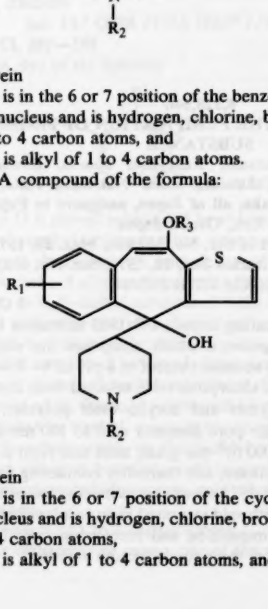


wherein

R_1 is in the 6 or 7 position of the benzocycloheptathiophene nucleus and is hydrogen, chlorine, bromine or alkoxy of 1 to 4 carbon atoms, and

R_2 is alkyl of 1 to 4 carbon atoms.

2. A compound of the formula:



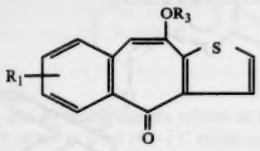
wherein

R_1 is in the 6 or 7 position of the cycloheptathiophene nucleus and is hydrogen, chlorine, bromine or alkoxy of 1 to 4 carbon atoms,

R_2 is alkyl of 1 to 4 carbon atoms, and

R_3 is alkyl of 1 to 4 carbon atoms.

4. A compound of the formula:



wherein

R_1 is in the 6 or 7 position of the cycloheptathiophene nucleus and is hydrogen, chlorine, bromine or alkoxy of 1 to 4 carbon atoms, and

R_3 is alkyl of 1 to 4 carbon atoms.

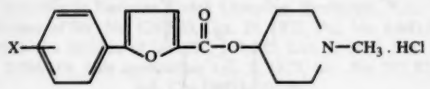
4,128,550

1-METHYL-4-PIPERIDYL 5-PHENYL-2-FUROATES

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,077
Int. Cl.[2] C07D *405/12*
U.S. Cl. 546—214 **3 Claims**

1. A compound of the formula:



wherein X is nitro or chloro.

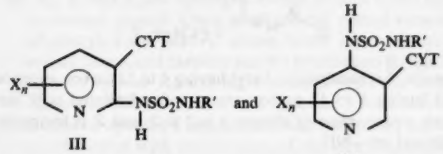
4,128,551

SUBSTITUTED PYRIDINE CARBOXYL HALIDES AND DERIVATIVES

Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 747,672, Dec. 6, 1976, Pat. No. 4,082,759, which is a division of Ser. No. 676,591, Apr. 13, 1976, Pat. No. 4,014,888, which is a continuation-in-part of Ser. No. 572,024, Apr. 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Jan. 20, 1978, Ser. No. 870,979
Int. Cl.[2] C07D *213/54*
U.S. Cl. 546—293 **1 Claim**

1. A compound of the formulae:



III IV

wherein:

each X independently represents loweralkyl of 1 to 6 carbon atoms, halologeralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, SR^5, OR^5, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;

n represents an integer of 0 to 3, inclusive;

Y represents sulfur;

T represents halo;

R′ represents aryl wherein aryl is phenyl, halophenyl, tolyl or benzyl;

each of R^3 and R^4 independently represents hydrogen or loweralkyl of 1 to 6 carbon atoms;

R^5 represents loweralkyl of 1 to 6 carbon atoms.

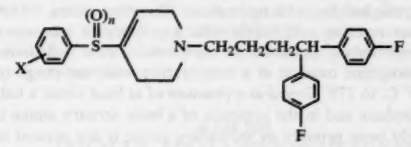
4,128,552

1-[4,4-BIS(4-FLUOROPHENYL)BUTYL]-4-PHENYLTHIO-1,2,3,6-TETRAHYDROPYRIDINES AND RELATED SULFOXIDES AND SULFONES

Lawrence D. Wise, Ann Arbor, Mich.; Patrick F. Flynn, Wilmington, Del., and Glenn C. Morrison, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 26, 1977, Ser. No. 836,866
Int. Cl.[2] C07D *213/04*
U.S. Cl. 546—294 **26 Claims**

1. A compound of the formula:



VI

in which X is hydrogen, halogen, trifluoromethyl, lower alkoxy, aryl of 6 to 10 carbon atoms, lower alkyl, nitro or amino n is 0, 1 or 2 and the corresponding pharmaceutically acceptable acid addition salts thereof.

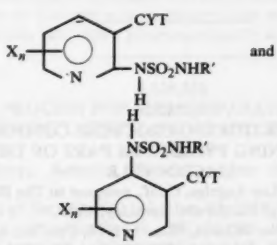
4,128,553

SUBSTITUTED PYRIDINE THIOCARBONYL HALIDES AND DERIVATIVES

Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 747,266, Dec. 3, 1976, Pat. No. 4,082,758, which is a division of Ser. No. 676,591, Apr. 13, 1976, Pat. No. 4,014,888, which is a continuation-in-part of Ser. No. 572,024, Apr. 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Jan. 20, 1978, Ser. No. 870,980
Int. Cl.[2] G07D *213/54*
U.S. Cl. 546—293 **1 Claim**

1. A compound of the formulae:



III IV

wherein:

each X independently represents loweralkyl of 1 to 6 carbon atoms, halologeralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, SR^5, OR^5, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;

n represents an integer of 0 to 3, inclusive;

Y represents sulfur;

T represents halo;

R′ represents hydrogen, loweralkyl of 1 to 6 carbon atoms, halologeralkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, haloalkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, haloalkynyl of 3 to 5 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, loweralkoxyalkyl wherein each of alkoxy and alkyl are of from 1 to 6 carbon atoms, dialkylaminoalkyl wherein each alkyl is of from 1 to 6 carbon atoms or $—C(CH_3)_2C{\equiv}N$;

each of R^3 and R^4 independently represents hydrogen or loweralkyl of 1 to 6 carbon atoms;

R^5 represents loweralkyl of 1 to 6 carbon atoms.

4,128,554

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACID AMIDES FROM ORGANIC HALIDES

Richard F. Heck, Wilmington, Del., assignor to University of Delaware, Newark, Del.

Continuation-in-part of Ser. No. 649,487, Jan. 15, 1976, abandoned, which is a division of Ser. No. 468,762, May 10, 1974, Pat. No. 3,988,358. This application Mar. 10, 1977, Ser. No. 776,289

Int. Cl.[2] C07D *213/56;* C07C *103/75*

U.S. Cl. 546—317 **4 Claims**

1. The catalytic process of producing amides from aryl, and heterocyclic halides, with up to about 30 carbon atoms, which comprises reacting said halide with a primary or secondary amine and carbon monoxide in the presence of a palladium-triarylphosphine catalyst at a temperature with the range of from 20° C. to 175° C. and at a pressure of at least about a half an atmosphere and in the presence of a basic tertiary amine if a strongly basic primary or secondary amine is not present in the equivalent or excess of the amount required for the reaction.

4,128,555

3-PHENOXYPYRIDINE MONOSULFATE AND A METHOD FOR ITS PRODUCTION

Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 751,933, Dec. 17, 1976, abandoned. This application May 27, 1977, Ser. No. 801,113

Int. Cl.[2] C07D *213/16*

U.S. Cl. 546—290 **1 Claim**

1. 3-Phenoxypyridine monosulfate.

4,128,556

CERTAIN MULTIOXYMACROCYCLE COMPOUNDS CONTAINING PYRIDYL AS PART OF THE MACROCYCLE

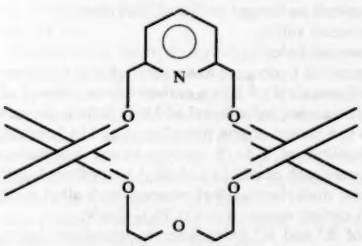
Donald J. Cram, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 662,564, Mar. 1, 1976, Pat. No. 4,080,337, which is a division of Ser. No. 505,576, Sep. 12, 1974, Pat. No. 3,965,116. This application Nov. 21, 1977, Ser. No. 853,445

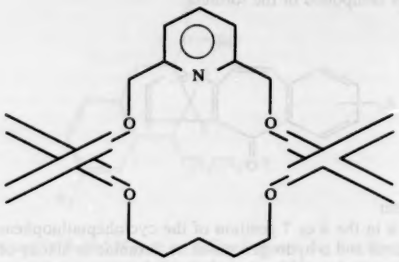
Int. Cl.[2] C07D *491/02, 491/12*

U.S. Cl. 546—26 **3 Claims**

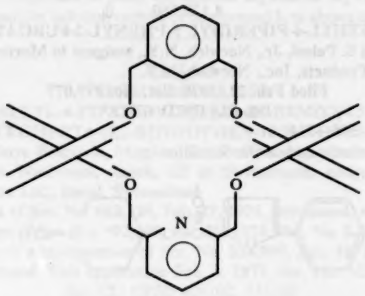
1. A compound of the formula:



2. A compound of the formula:



3. A compound of the formula:



4,128,557

SILVER SALTS OF 1,2,4-MERCAPTOTRIAZOLE DERIVATIVES

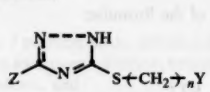
Phillip D. Knight, Fairport; Richard A. deMauriac, Webster, and Patricia A. Graham, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 778,183, Mar. 16, 1977. This application Nov. 3, 1977, Ser. No. 848,254

Int. Cl.[2] C07F *1/10;* G03C *1/02*

U.S. Cl. 260—299 **9 Claims**

1. The silver salt of a 1,2,4-mercaptotriazole derivative represented by the formula:



wherein Y is unsubstituted aryl having 6 to 12 carbon atoms or aryl having 6 to 12 carbon atoms and substituted with methoxy, cyano, nitro or chloro; n is 0 to 2; and Z is hydrogen, hydroxyl or $—NH_2$.

4,128,558

N(O,O DIALKYLPHOSPHONYL ALKYLENE) ESTERS OF OXAZOLIDONE, BENZOXAZOLINONE AND DIHYDROOXAZINONE

Udo W. Hendricks, Cologne, and Klaus Walz, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

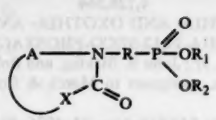
Filed Jul. 11, 1975, Ser. No. 595,284

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1974, 2434312

Int. Cl.[2] C07D *263/04, 265/04, 273/02*

U.S. Cl. 260—307 C **6 Claims**

1. Compound of the formula



in which

R_1 and R_2 independently of one another are alkyl with 1–4 C-atoms or alkyl of 1–4 C-atoms substituted by chlorine or bromine;

A and X conjointly with the nitrogen atom and the carbonyl group form an oxazolidone, benzoxazolinone or dihydro oxazinone ring which is unsubstituted; and

R is alkylene with 2–4 carbon atoms.

4,128,559

BENZOTRIAZOLE ORTHO-ESTER COMPOUNDS USEFUL AS ULTRAVIOLET STABILIZERS

David M. Pond, and Richard H. Wang, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 626,520, Oct. 28, 1975, Pat. No. 4,041,011, which is a division of Ser. No. 511,565, Oct. 2, 1974, Pat. No. 3,936,418. This application Apr. 1, 1977, Ser. No. 783,578

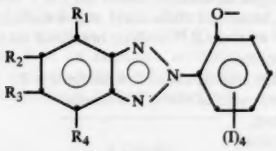
Int. Cl.[2] C07D *249/20*

U.S. Cl. 260—308 B **32 Claims**

1. A composition of matter comprising compounds having the formula:

$(A)_x—C$

wherein A is a group having the structure



wherein

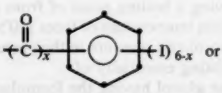
R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, cycloalkyl, phenyl, lower alkyl phenyl, phenyl-substituted-phenyl, lower alkoxy, amino, lower alkyl substituted amino, cyano, and carboxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the carbonyl group connecting the heterocyclic aromatic A group with the aromatic C group,

x is an integer of 1 to 6; and

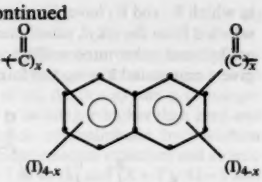
C is one of the following:

An aromatic group having the formula:



or

-continued



wherein I is the same substituent as listed above and is present in all positions of the benzenoid ring except the carbon atom attached to the carbonyl group connecting the A and C moieties, and said I substituents can all be one of the substituents listed above or different listed substituents.

4,128,560

TRICYCLIC ALKYLAMINE DERIVATIVES

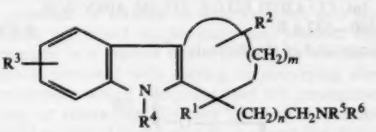
Andre A. Asselin, Lemoyne; Leslie G. Humber, and Thomas A. Dobson, both of Dollard des Ormeaux, all of Canada, assignors to Ayerst McKenna & Harrison Ltd., Montreal, Canada

Continuation of Ser. No. 480,460, Jun. 18, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,173

Int. Cl.[2] C07D *209/86*

U.S. Cl. 260—315 **22 Claims**

1. A compound of the formula 1



1.

in which R^1 is lower alkyl, R^2 is hydrogen or lower alkyl, R^3 is hydrogen, lower alkyl, halo, hydroxy, lower alkoxy, lower alkanoyloxy or trihalomethyl, R^4 is hydrogen or lower alkyl, R^5 and R^6 are the same or different and are selected from the group consisting of hydrogen and lower alkyl, m is an integer from two to four and n is an integer from zero to two; or an acid addition salt with a pharmaceutically acceptable acid.

4,128,561

PROCESS FOR THE PREPARATION OF 2-(2-THIENYL)-ETHYLAMINE AND DERIVATIVES THEREOF

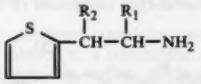
Emile Braye, Auterive, France, assignor to Parcor, Paris, France

Division of Ser. No. 640,142, Dec. 12, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 749,033

Int. Cl.[2] C07D *333/00, 209/48, 333/20*

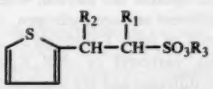
U.S. Cl. 260—329 AM **3 Claims**

1. Process for the preparation of compounds having the formula:



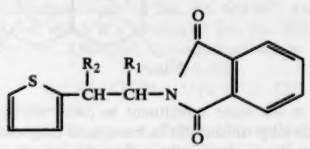
(I)

in which R_1 and R_2 are each selected from the group consisting of hydrogen, the lower alkyl groups, the phenyl radical and the substituted phenyl radicals, comprising reacting in the presence of a base a derivative of the formula:



(II)

in which R_1 and R_2 have the above-defined meanings and R_3 is selected from the alkyl, substituted alkyl, aryl, substituted aryl, aralkyl and substituted aralkyl groups with phthalimide, to give a compound having the formula:



(III)

which is subsequently transaminated by reacting with an amine at elevated temperature.

4,128,562

NOVEL 3-(PHOSPHORYLOXY) AND (PHOSPHONYLOXY)-THIOPHENES

Jacques Perronnet, Paris, and Laurent Taliani, Les Pavillons-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

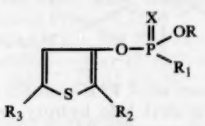
Continuation of Ser. No. 652,718, Jan. 27, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 850,922

Claims priority, application France, Feb. 14, 1975, 75 04628

Int. Cl.[2] C07D *333/16, 333/00;* **A01N** *9/36*

U.S. Cl. 260—332.3 R **8 Claims**

1. A compound of the formula



wherein R is alkyl of 1 to 4 carbon atoms, R_1 is alkoxy of 1 to 4 carbon atoms, R_2 is cyano, R_3 is selected from the group consisting of alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms and alkylthio of 1 to 6 carbon atoms and phenyl and X is selected from the group consisting of oxygen and sulfur.

4,128,563

ALLYLIC METHYL-HYDROXYLATED NOVOBIOCINS

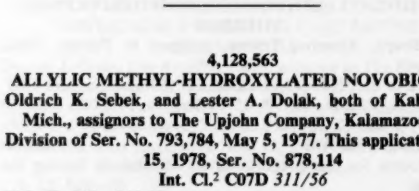
Oldrich K. Sebek, and Lester A. Dolak, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 793,784, May 5, 1977. This application Feb. 15, 1978, Ser. No. 878,114

Int. Cl.[2] C07D *311/56*

U.S. Cl. 260—343.45 **5 Claims**

1. A hydroxynovobiocin-type compound of the formula:



II

or pharmaceutically acceptable salt thereof, where R_5 and R_8 may be the same or different and are hydrogen, alkyl of 1 thru 5 carbon atoms, alkenyl of from 1 through 5, carbon atoms, halogen, nitro, cyano, carboxyl or $-NR_\alpha R_\beta$ where R_α and R_β may be the same or different and are hydrogen or alkyl of 1 thru 5 carbon atoms; ═ is a single or double bond.

4,128,564

9-THIA- AND OXOTHIA- AND 9-DIOXOTHIA-11,12-SECO-PROSTAGLANDINS

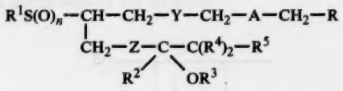
Edward J. Cragoe, Jr.; John B. Bicking, and Robert L. Smith, all of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 743,821, Nov. 22, 1976, Pat. No. 4,066,675, which is a division of Ser. No. 669,006, Mar. 22, 1976, Pat. No. 4,018,802, which is a continuation-in-part of Ser. No. 566,566, Apr. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 483,178, Jun. 25, 1974, abandoned. This application Oct. 25, 1977, Ser. No. 844,687

Int. Cl.[2] C07C *143/90;* **C11D** *1/28*

U.S. Cl. 260—401 **8 Claims**

1. The compound of the formula



wherein

R is derivatized carboxy in which R is selected from alkoxycarbonyl (—$COOR^6$ wherein R^6 is alkyl having 1–10 carbon atoms), carbamoyl (—$CONH_2$), and substituted carbamoyl (—$CONR^7R^8$) wherein R^7 and R^8 are selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, and diloweralkylaminoalkyl having 4–7 carbon atoms;

A is methylene;

Y is selected from the group consisting of ethylene, vinylene, and ethynylene;

R^1 is selected from the group consisting of methyl, ethyl, 2-hydroxyethyl, 2-(loweralkoxy)ethyl, and vinyl;

n is 0, 1, or 2;

Z is selected from the group consisting of ethylene, vinylene, and ethynylene;

R^2 is hydrogen or methyl;

R^3 is hydrogen or loweralkanoyl of from 1–5 carbon atoms;

R^4 is hydrogen or methyl; and

R^5 is alkyl, branched chain alkyl of 3–6 carbon atoms, vinyl, or OR^{5a} wherein R^{5a} is alkyl, branched alkyl of from 2–5 carbon atoms.

3. The compound of claim 1 wherein n is 2.

6. The compound of claim 3 wherein

Y is ethylene;

A is methylene;

Z is ethylene;

R^1 is methyl; and

R^2, R^3, and R^4 are hydrogen.

8. The compound of claim 6 wherein

R is N-(2-dimethylaminoethyl)carbamoyl and

R^5 is butyl, which is N-(2-dimethylaminoethyl)-8-methylsulfonyl-12-hydroxyheptadecanamide.

4,128,565

PROCESS FOR PREPARING METHYLTIN CHLORIDES

Kunihiko Yajima, Yokohama, and Shuji Sayama, Fuchu, both of Japan, assignors to Sankyo Organic Chemicals Company Limited, Kawasaki, Japan

Filed Sep. 22, 1976, Ser. No. 725,519

Claims priority, application Japan, Sep. 29, 1975, 50-117560

Int. Cl.[2] C07F *7/22*

U.S. Cl. 260—429.7 **12 Claims**

1. In a process for preparing a methyltin chloride through direct reaction of methyl chloride with metallic tin, the improvement wherein the reaction is effected in a high-boiling hydrocarbon having a boiling point of from about 120° C. to 400° C. at a reaction temperature of from 120° C. to 300° C. and substantially atmospheric pressure in the presence of a reaction accelerator consisting essentially of

(A) at least one glycol having the formulae

$C_mH_{2m}(OH)_2$

wherein m is an integer of from 2 to 10,

$HO(C_2H_4O)_nC_2H_4OH$

wherein n is an integer of from 1 to 10,

$HO(C_3H_6O)_pC_3H_6OH$

wherein p is an integer of from 1 to 8 and

$HO(C_2H_4S)_qC_2H_4OH$

wherein q is an integer of from 1 to 3; and

(B) iodine or an iodine compound having the formula

MI

wherein M is an alkali metal.

4,128,566

PROCESS FOR THE PREPARATION OF ALUMINUM POLYMERIC COMPOUNDS OF POLYIMINE NATURE

Margherita Corbellini, Milan, and Agostino Balducci, San Donato Milanese, both of Italy, assignors to Snamprogetti, S.p.A., San Donato Milanese, Italy

Division of Ser. No. 592,222, Jul. 1, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 762,117

Claims priority, application Italy, Jul. 1, 1974, 24661 A/74

Int. Cl.[2] C07F *5/06*

U.S. Cl. 260—448 R **4 Claims**

1. Process for the preparation of aluminum compounds of the formula $Al_h(NR)_kH_iY_j$ wherein R is a aliphatic, aromatic or cycloaliphatic hydrocarbon radical, H is hydride hydrogen, Y is halogen, k ranges from 2 to 50 $h/k>1$, $(i+j)/h>1$, $i\neq 0$ and $j\geqq 0$, said process consisting in reacting aluminum compounds of polyimine nature have the chemical compositions

(a) $(Al\ X\ -\ NR)_n$ and

(b) $(X\text{-}Al\ NR)_x\ (XYAl)_y\ (NHR)_y$

in which X and Y are the same or different, and mean hydride hydrogen and/or halogen atoms directly bound to aluminum, n is an integer lower than or equal to 10, y is an integer higher than zero and R is an aliphatic, aromatic or cycloaliphatic hydrocarbon radical, with alkali or alkaline-earth metal alanates or with aluminum hydride complexes.

4,128,567

ALUMINIUM POLYMERIC COMPOUNDS OF POLYIMINE NATURE

Margherita Corbellini, Milan, and Agostino Balducci, San Donato Milanese, both of Italy, assignors to Snamprogetti, S.p.A., Milanese, Italy

Continuation of Ser. No. 592,222, Jul. 1, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,542

Claims priority, application Italy, Jul. 1, 1974, 24661 A/74

Int. Cl.[2] C07F *5/06*

U.S. Cl. 260—448 R **6 Claims**

1. An aluminum polymeric compound of polyimine nature having the general formula

$Al_h(NR)_kH_iY_jI$

wherein R is an aliphatic, aromatic or cycloaliphatic hydrocarbon radical, H is hydride hydrogen, Y is halogen, K ranges from 2 to 50, $h/k > 1$, $(i + j)/h > 1$, $1 \neq 0$ and $j \geqq 0$, compound I being prepared by reacting an aluminum compound of polyimine nature selected from the group having the chemical compositions

$$[\ XAl\text{ - }NR\ -_n\text{ - }XAl\text{ -}NR)_n \qquad \text{(a) (a)}$$

and

$$(X\text{-}Al\text{-}NR)_x\ (XYA1)_y\ (NHR)_y \qquad \text{(b)}$$

wherein X and Y, the same or different, mean hydride hydrogen and/or halogen atoms directly bound to aluminum, n is an integer lower than or equal to 10, the $(x+y)$ sum is an integer lower than or equal to 10, y is an integer higher than zero and R is an aliphatic, aromatic or cycloaliphatic hydrocarbon radical, characertized by a tridimensional structure and atomic ratios $X/Al=1$ and $N/Al=1$ as to (a) and $(X+Y)/Al=1$ and $N/Al=1$ as to (b) with alkali or alkaline-earth metal alanates or with aluminum hydride complexes.

4,128,568

PROCESS FOR THE CONTINUOUS PREPARATION OF POLYDIORGANOSILOXANES

Werner Büchner, Leverkusen; Bruno Degen, Bergisch-Gladbach; Ludwig Fries, Leverkusen; Judat Helmut, Langenfeld; Rudolf Mundil, Leverkusen, and Karl-Heinz Rudolph, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 2, 1978, Ser. No. 875,025

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705563

Int. Cl.[2] C07F *7/08*

U.S. Cl. 260—448.2 E **5 Claims**

1. In a process for the continuous production of high polymer viscous organosiloxanes comprising reacting diorganosiloxanes with substances regulating the chain length in the presence of alkaline or acid catalysts and wherein the reactants are mixed mechanically and wherein the reaction takes place in a reactor which consists of several zones and which is provided with stirring or conveying elements the improvement which comprises that the arrangement of the stirring or conveying elements being such that the flow of material produced by the stirring or conveying element in each zone is the opposite of that in the adjacent zone.

4,128,569

CONTINUOUS MANUFACTURE OF ORGANIC ISOCYANATES

Peter Horn, Hirschberg; Waldemar Koehler, Frankenthal, and Rolf Bittler, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 17, 1977, Ser. No. 797,814

Claims priority, application Fed. Rep. of Germany, May 31, 1976, 2624285

Int. Cl.[2] C07C *118/02*

U.S. Cl. 260—453 PH **9 Claims**

1. In a process for the continuous manufacture of an organic isocyanate from an organic amine and phosgene in the presence of an organic solvent, wherein the organic isocyanate, organic amine, phosgene and organic solvent are conducted into a reaction chamber to form a reaction solution and a portion of the reaction solution is recycled, the improvement comprising:

mixing phosgene with the recycled portion of the reaction solution,

feeding the phosgene-containing recycled portion of the reaction solution to a nozzle, the exit of said nozzle extending below the surface of the reaction solution contained in the reaction chamber,

accelerating the phosgene-containing recycled portion of the reaction solution through the nozzle such that the recycled reaction solution issues from the nozzle as a drive jet having a velocity of from 1 to 40 m/sec thereby forming a mixing and reaction zone within the reaction chamber,

while simultaneously feeding organic amine or amine solution at a velocity of from 0.3 to 30 m/sec to the drive jet of the recycled phosgene-containing reaction solution in the mixing and reaction zone, so that the volume ratio of

the total amount of phosgene-containing recycled reaction solution to the amount of organic amine or amine solution is from 300:1 to 1:1,

whereby an energy dissipation density of from 5 to 1000 kJoule per m^3 of phosgene-containing reaction solution plus amine feed is generated in the mixing and reaction zone.

4,128,570

ANTI-ALLERGIC OXANIL COMPOUNDS

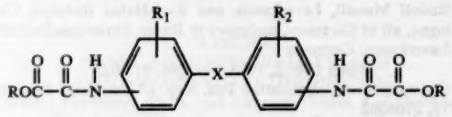
Charles M. Hall, and John B. Wright, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 645,024, Dec. 29, 1975, Pat. No. 4,061,791. This application Oct. 6, 1977, Ser. No. 839,863

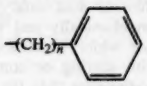
Int. Cl.[2] C07C *101/100, 121/78*

U.S. Cl. 260—465 D **13 Claims**

1. A compound of the formula

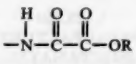


wherein R is selected from the group consisting of hydrogen, a physiologically acceptable metal or amine cation, alkyl of one to six carbon atoms, inclusive, and

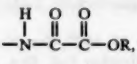


wherein n is 0, 1 or 2;

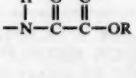
R_1 and R_2 are the same or different and are selected from the group consisting of cyano, nitro, and



with the proviso that when R_1 and/or R_2 is



neither R_1 nor R_2 is ortho to the other



moiety;

X is

4,128,571

THERMAL CONVERSION OF 4-CYANO-SUBERONITRILE TO ACRYLONITRILE

Charles R. Campbell; William A. Heckle, and Marion J. Mathews, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 27, 1977, Ser. No. 846,100

Int. Cl.[2] C07C *121/32, 121/16*

U.S. Cl. 260—465.9 **7 Claims**

1. A continuous process for producing acrylonitrile from 4-cyano-suberonitrile comprising passing 4-cyano-suberonitrile in atomized form through an essentially oxygen and catalyst-free reaction zone at a temperature of about 700°–800° C., an hourly space velocity of 2400–9300 and a linear velocity of 5–20 ft/sec.

4,128,572

PROCESS FOR PREPARING PHENYLACETIC ACID

Luigi Cassar, and Marco Foà, both of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 18, 1978, Ser. No. 870,324

Claims priority, application Italy, Jan. 18, 1977, 19389 A/77

Int. Cl.[2] C07C *51/00, 63/54*

U.S. Cl. 562—406 **10 Claims**

1. A process for preparing alkaline salts of phenylacetic acid by reacting a benzyl halide selected from chloride and bromide with carbon monoxide in the presence of a catalyst consisting in a salt of cobalt hydrocarbonyl, characterized in that the reaction is conducted in an aqueous/organic diphase system consisting of (a) an aqueous solution of an inorganic alkaline base and (b) the benzyl halide in an organic solvent, in the presence of a catalyst system composed by a quaternary alkylammonium salt and by a cobalt hydrocarbonyl salt, at atmospheric pressure and at a temperature ranging from about 20° to 70° C.

4,128,573

2-(SUBSTITUTED PHENYL)PROPIONIC ACIDS

Stewart S. Adams; Bernard J. Armitage; John S. Nicholson, and James G. Tantum, all of Nottingham, England, assignors to Boots Pure Drug Company Limited, Nottingham, England

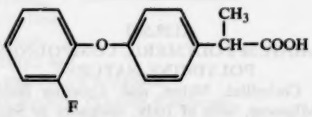
Continuation of Ser. No. 488,739, Jul. 15, 1974, abandoned, which is a continuation of Ser. No. 123,034, Mar. 10, 1971, abandoned. This application Sep. 22, 1976, Ser. No. 725,645

Claims priority, application United Kingdom, Mar. 16, 1970, 12570/70

Int. Cl.[2] C07C *69/76*

U.S. Cl. 562—465 **2 Claims**

1. A compound of the formula



together with the pharmaceutically acceptable lower alkyl esters, inorganic salts and organic salts thereof.

4,128,574

METHOD FOR MAKING ORGANIC POLYCARBOXYLIC ACIDS

Ronald L. Markezich, and Tohru Takekoshi, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

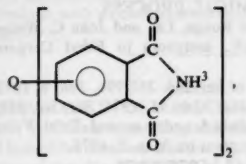
Filed Oct. 4, 1976, Ser. No. 729,126

Int. Cl.[2] C07C *65/14*

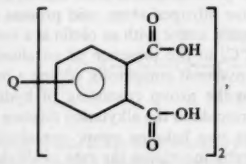
U.S. Cl. 562—473 **11 Claims**

5. A method which comprises

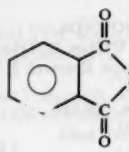
(1) heating at a temperature of at least 100° C. in the presence of water, a mixture comprising a bisimide of the formula,



and phthalic anhydride or phthalic acid to produce a mixture comprising

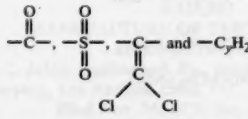


and an N-organo phthalimide of the formula,



(2) effecting the separation of the N-organo phthalimide from the mixture of (1),

where Q is a divalent radical selected from —O—, —S—, $—R^2—$, $—O—R^2—O—$, $—S—R^2—S—$ and $—OR^2XR^2O—$, X is selected from —O—, —S—,



and y is equal to 0 to 5 inclusive, R^2 is selected from $C_{(6-13)}$ divalent aromatic organic radicals and $C_{(1-8)}$ alkylene radicals, and R^3 is selected from H and $C_{(1-20)}$ monovalent organic radicals.

4,128,575

PROCESS FOR THE MANUFACTURE OF GLYCOLIC ACID OR ITS ESTERS

Ernst I. Leupold, Westerfeld, and Hans-Jurgen Arpe, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 853,210

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1976, 265207; Nov. 15, 1976, 2652003; Sep. 15, 1977, 2741505

Int. Cl.² C07C *59/06*

U.S. Cl. 562—579 **6 Claims**

1. Process for the manufacture of glycolic acid or an ester thereof which comprises reacting paraformaldehyde or trioxane or a mixture thereof with formic acid or a formic acid ester in the liquid phase at a temperature of from 70° to 200° C. in the presence of a strongly acidic catalyst.

4,128,576

O-AROYLVINYL BENZOYL CHLORIDES

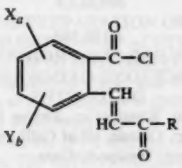
John A. Houbion, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1978, Ser. No. 867,722

Int. Cl.² C07C *63/10*

U.S. Cl. 260—544 D **14 Claims**

1. A compound of the formula



wherein X is halogen, Y is lower alkoxy or alkyl, nitro or trifluoromethyl, a is zero to 4, b is zero to 2, the sum of a + b is zero to 4, and R is phenyl, naphthyl or substituted phenyl, there being from 1 to 3 substituents selected from lower alkyl, lower alkoxy, halogen, CF_3 and nitro.

4,128,577

15-METHYL- AND 16-PHENOXY-$PGF_2\alpha$, AMIDES

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 719,055, Aug. 30, 1976, Pat. No. 4,073,808, which is a continuation-in-part of Ser. No. 645,276, Dec. 29, 1975, abandoned. This application Dec. 12, 1977, Ser. No. 859,639

Int. Cl.² C07C *177/00*

U.S. Cl. 260—559 B **2 Claims**

2. 16-Phenoxy-17,18,19,20-tetranor-$PGF_2\alpha$, amide.

4,128,578

PROCESS FOR THE MANUFACTURE OF 3-HYDROXYBUTYRIC ACID ARYLAMIDES WITH TRIALKYL PHOSPHATE AND SUBSTITUTED PHOSPHINE PROMOTOR

Kurt Kümmerle, Kelkheim; Hartmut Heise, Bad Soden am Taunus, and Ernst Hille, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 8, 1977, Ser. No. 775,461

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609835

Int. Cl.² C07B *1/00*; C07C *102/00*

U.S. Cl. 260—562 R **17 Claims**

1. In a process for the liquid-phase catalytic hydrogenation of N-acetoacetyl arylamides to yield 3-hydroxybutyric acid arylamides at elevated temperatures the improvement comprising adding to the reaction mixture an effective amount of a promoter selected from phosphines, trialkyl phosphates and mixtures thereof to promote said catalytic hydrogenation.

4,128,579

PROCESS FOR THE MANUFACTURE OF α,β-UNSATURATED CYCLOALIPHATIC KETOXIMES

Rüdiger Berthold, Bad Soden am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,738

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654851

Int. Cl.² C07C *131/08*

U.S. Cl. 260—566 A **9 Claims**

1. In a process for preparing α,β-unsaturated cycloaliphatic ketoximes and their hydrochlorides, sulfates or hydrogensulfates by reaching α,β-unsaturated cycloaliphatic ketones with

hydroxyl amine hydrochloride or sulfate or hydrogensulfate the improvement comprising conducting the reaction in water in a pH range of 0 to 4.5.

4,128,580

PROCESS FOR THE PRODUCTION OF 1,3-DICHLOROACETONE OXIME AND ITS ACETATE DERIVATIVE

Kent E. Matsumoto, Kensington; Jimmy H. Chan, Martinez, and Don R. Baker, Orinda, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 653,797, Jan. 30, 1976, abandoned. This application Dec. 21, 1976, Ser. No. 751,491

Int. Cl.[2] C07C *131/00*

U.S. Cl. 260—566 A **23 Claims**

1. A process for the production of 1,3-dichloroacetone oxime comprising reacting 1,3-dichloropropanone with a hydroxylamine salt in the presence of a base selected from the group consisting of tertiary amines, lower alkyl amides, alkali metal bicarbonates, alkali metal carbonates, and alkaline earth metal carbonates, establishing the pH of the reaction system at a value of 2 or less and thereafter maintaining the pH of the reaction system at a value of 2 or less throughout the remainder of the reaction.

4,128,581

KETOXIME CARBAMATES

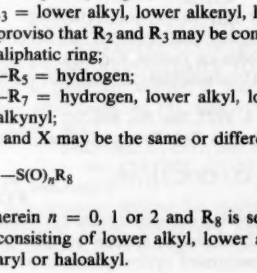
Thomas A. Magee, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 553,648, Feb. 27, 1975, Pat. No. 4,028,413, which is a continuation-in-part of Ser. No. 229,207, Feb. 24, 1972, Pat. No. 3,875,232, which is a continuation-in-part of Ser. No. 132,584, Apr. 8, 1971, abandoned. This application Apr. 13, 1977, Ser. No. 786,974

Int. Cl.[2] C07C *131/00*

U.S. Cl. 260—566 AC **6 Claims**

1. A composition of matter having the formula:



where:

$R_2 = R_3$ or hydrogen;

$-R_3$ = lower alkyl, lower alkenyl, lower alkynyl, with the proviso that R_2 and R_3 may be connected to form a cycloaliphatic ring;

R_4–R_5 = hydrogen;

R_6–R_7 = hydrogen, lower alkyl, lower alkenyl, or lower alkynyl;

R_1 and X may be the same or different and each is

$$-S(O)_nR_8$$

wherein $n = 0$, 1 or 2 and R_8 is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, aryl or haloalkyl.

4,128,582

CHEMICAL PROCESS

Luke J. Governale, Baton Rouge, La., and John C. Wollensak, Bloomfield Hills, Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 365,996, Jun. 4, 1973, abandoned. This application Mar. 11, 1974, Ser. No. 449,837

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976.

Int. Cl.[2] C07C *87/28*

U.S. Cl. 260—578 **66 Claims**

1. In a process for alkylating an aromatic amine selectively in an ortho nuclear position, said aromatic amine having an unsubstituted ortho nuclear position and at least one hydrogen atom bonded to said amine nitrogen atom, said process comprising reacting said aromatic amine with an olefin at a temperature of about 200°–500°C. in the presence of an aluminum anilide catalyst, the improvement comprising adding a hydrogen halide selected from the group consisting of hydrogen chloride and hydrogen bromide to the alkylation mixture in an amount to provide up to two halogen atoms per aluminum atom in said mixture thereby increasing the rate of alkylation.

4,128,583

DIFLUORAMINO COMPOUNDS

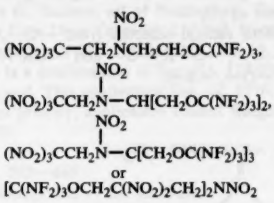
Charles Wiener, Middletown, N.Y., and William E. Tyler, III, New Providence, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 29, 1966, Ser. No. 540,142

Int. Cl.[2] C07C *93/00*

U.S. Cl. 260—584 C **1 Claim**

1. A compound comprising



or

4,128,584

OPTICALLY ACTIVE SULFONATES OF ALLETHROLONE

Jacques Martel, Bondy, and Jean Tessier, Vincennes, both of France, assignors to Roussel Uclaf, Paris, France

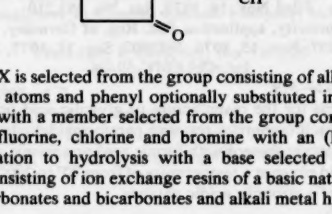
Filed Jun. 16, 1977, Ser. No. 807,069

Claims priority, application France, Jun. 23, 1976, 76 19087

Int. Cl.[2] C07C *45/24, 45/00*

U.S. Cl. 260—586 R **4 Claims**

1. A process for the preparation of optically active allethrolone comprising subjecting an optically active sulfonate of the formula



wherein X is selected from the group consisting of alkyl of 1 to 3 carbon atoms and phenyl optionally substituted in the para position with a member selected from the group consisting of methyl, fluorine, chlorine and bromine with an (R) or (S) configuration to hydrolysis with a base selected from the group consisting of ion exchange resins of a basic nature, alkali metal carbonates and bicarbonates and alkali metal hydroxides

with the latter being used at most in stoichiometric amounts in a water-immiscible organic solvent to obtain optically active allethrolone with a configuration opposite to that possessed by the sulfonate.

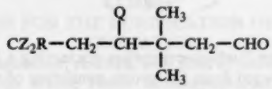
4,128,585

PREPARATION OF HALOGENATED ALDEHYDES

Peter J. V. Cleare, Ascot, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 737,274, Nov. 1, 1976, Pat. No. 4,085,148.
This application Dec. 20, 1977, Ser. No. 862,519
Int. Cl.[2] C07C *47/02*
U.S. Cl. 260—601H 4 Claims

1. A compound of formula:



where Q, R and Z are independently selected from chlorine or bromine provided that Q is always bromine when either of R and Z are bromine.

4,128,586

CATALYTIC REDUCTION OF AROMATIC SULFONYL HALIDES WITH HYDROGEN SULFIDE TO YIELD AROMATIC THIOLS

Charles T. Ratcliffe, Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Feb. 27, 1978, Ser. No. 881,952
Int. Cl.[2] C07C *149/28*
U.S. Cl. 260—609 D 20 Claims

1. A process for reducing aromatic sulfonyl halides comprising

contacting the sulfonyl halide with hydrogen sulfide for producing reduced derivatives of the sulfonyl halide.

4,128,587

MANUFACTURE OF TERTIARY BUTYL HYDROPEROXIDE

John C. Jubin, Wallingford, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 26, 1976, Ser. No. 745,142
Int. Cl.[2] C07D *179/02*
U.S. Cl. 568—571 4 Claims

1. In the method in which a liquid feedstock containing a major amount of liquid isobutane is oxidized continuously by an oxygen-containing gas in a reactor of a predetermined size at a pressure maintaining isobutane in liquid phase, said pressure being within a range from 300 to 1000 psig, at a temperature within a range from about 250° F. to about 300° F. in an oxidation zone to produce continuously a liquid effluent from said reactor, processing said reactor effluent to separate unreacted isobutane and to separate a liquid oxidate containing tertiary butyl hydroperoxide from said reactor effluent, and recovering continuously a product containing tertiary butyl hydroperoxide from said method, the improvement which consists of:

employing as the liquid feedstock for said continuous method a mixture consisting of from 70% to 90% isobutane and an amount of tertiary butyl alcohol constituting from 10% to 30% by weight of said feedstock;

said tertiary butyl alcohol in said feedstock enhancing the rate of production of tertiary butyl hydroperoxide in said reactor of a predetermined size so that the rate of tertiary butyl hydroperoxide production assuredly measures greater than the rate of tertiary butyl hydroperoxide production measured at conditions in the absence of said tertiary butyl alcohol in the feedstock and said tertiary butyl alcohol in said feedstock enhancing the selectivity for the formation of tertiary butyl hydroperoxide in said oxidation zone, so that the quantity of tertiary butyl hydroperoxide relative to tertiary butyl alcohol formed in said liquid oxidate assuredly measures significantly greater than the quantity of teritary butyl hydroperoxide measured in a liquid oxidate obtained at corresponding conditions in the absence of said tertiary butyl alcohol in the feedstock.

4,128,588

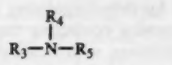
PROCESS FOR THE PREPARATION OF NITROPHENYL HYDROXY SUBSTITUTED ACETYLENE AND CONVERSION TO NITROPHENYLACETYLENE

Edward T. Sabourin, Allison Park, and Charles M. Selwitz, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 11, 1977, Ser. No. 840,553
Int. Cl.[2] C07C *79/10, 33/04*
U.S. Cl. 260—645 10 Claims

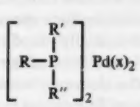
1. A process for the production of a nitrophenyl hydroxy substituted acetylene which comprises:

reacting a nitrobromobenzene with a substituted terminal acetylene compound containing at least three carbon atoms and an hydroxy group on the carbon atom adjacent to the acetylene group in the presence of a solvent comprising a compound having the formula:



where R_3, R_4, and R_5 can be the same or different and are selected from the group consisting of hydrogen and lower alkyl groups having from 1 to 4 carbon atoms with the proviso that no more than one of said R groups can be hydrogen, and in the added presence of:

a catalyst comprising a compound having the formula:



where

x can be Br, I, or Cl;

and where R, R′ and R″ can be the same or different and are selected from the group consisting of phenyl, substituted phenyl and alkyl groups having from 1 to 4 carbon atoms,

and a promoter comprising cuprous iodide; to produce HBr and the resultant nitrophenylhydroxyacetylene.

4,128,589

GENERATION OF CF_4 FROM TEFLON FOR REACTIVE ATMOSPHERE PROCESSING AND GROWTH OF METAL FLUORIDES

Ricardo C. Pastor, Manhattan Beach, and Morton Robinson, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 22, 1977, Ser. No. 808,844
Int. Cl.[2] C07C *21/18*
U.S. Cl. 260—653 6 Claims

1. A controllable process for generating CF_4 from commercially available polytetrafluoroethylene comprising the steps of:

(a) charging a depolymerization reactor with precisely known quantities of tetrafluoroethylene;

(b) selecting a reactor temperature, from a plot of tetrafluoroethylene decay constants versus temperature, which provides for the generation of C_2F_4 at a desired rate;

(c) creating an atmospheric purge by causing an inert carrier gas to flow through said reactor;

(d) raising the temperature of said reactor to said selected temperature thereby causing a C_2F_4-purge gas mixture to be formed within said reactor;

(e) directing said C_2F_4-purge gas mixture from said reactor into a pyrolysis chamber, previously heated to a temperature high enough to cause the C_2F_4 component of said mixture to decompose into known amounts of CF_4 and elemental carbon, at a flow rate sufficient to insure a gas mixture dwell time within said chamber of from 5 to 15 minutes; and

(f) removing said CF_4 from said chamber with said carrier gas while allowing said elemental carbon to be trapped along the relatively cool walls of said chamber.

4,128,590
DEHYDROGENATION METHOD

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 673,764, Apr. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 538,240, Jan. 2, 1975, Pat. No. 3,957,624. This application Apr. 15, 1977, Ser. No. 788,101
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.[2] C07E *5/36*
U.S. Cl. 260—666 A **34 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite consisting essentially of a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, and about 0.01 to about 5 wt. % germanium; wherein the platinum group metal, catalytically available cobalt and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

4,128,591
ALKYL AROMATIC ISOMERIZATION

William C. Carr, Weehawken; Leon M. Polinski, North Plainfield; Saul G. Hindin, Mendham, and James L. Kosco, Fanwood, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed May 31, 1977, Ser. No. 802,204
Int. Cl.[2] C07C *15/08*
U.S. Cl. 260—668 A **2 Claims**

1. A process for isomerizing C_8 alkyl aromatic compounds including ethylbenzene in amounts greater than the equilibrium amount comprising passing said alkyl aromatic compounds and hydrogen under isomerizing conditions over a catalyst and producing a near equilibrium amount of mixed xylenes and ethylbenzene, said catalyst consisting essentially of:

(a) a catalytically active amount of a component selected from the group consisting of platinum and platinum plus one or more of palladium, ruthenium, rhodium, iridium, and rhenium, deposited on particulate alumina; and

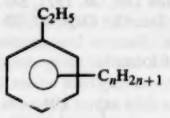
(b) particulate hydrogen mordenite containing less than 0.1 gram equivalent of alkali and alkaline earth metal cations per gram atom of aluminum and having a silica to alumina ratio greater than about 9-11 to 1 and less than about 17 to 1, said component on particulate alumina of (a) and said particulate hydrogen mordenite of (b) being prepared separately and thereafter combined to produce said catalyst.

4,128,592
SELECTIVE PRODUCTION OF PARA DIALKYL BENZENE

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,454
Int. Cl.[2] C07C *3/52, 3/62*
U.S. Cl. 260—671 C **16 Claims**

1. Process for selectively producing the para isomer of the compound:



where n is 1 or 2 which comprises contacting a hydrocarbon precursor selected from the group consisting of ethylbenzene and mixtures of ethylbenzene or toluene with ethylene in which the molar ratio of ethylbenzene or toluene to ethylene is between about 1 and about 10, under conversion conditions, in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, characterized by a silica to alumina mole ratio of at least about 12, a constraint index within the approximate range of 1 to 12 and a minimum crystal dimension greater than about 0.5 micron, said zeolite having undergone the following prior sequential treatment:

(1) steaming at a temperature of between about 250° and about 1000° C. for a period of at least 0.5 hour;

(2) impregnation with at least about 0.25 weight percent of phosphorus oxide;

(3) impregnation with at least about 0.25 weight percent of magnesium oxide and

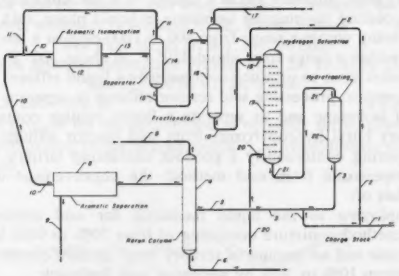
(4) coking for deposition of at least about 1 weight percent of coke thereon

to yield a resulting reaction product mixture in which the para isomer of said compound is present in an amount exceeding 99 percent of the total of said compound produced.

4,128,593
PRODUCTION AND RECOVERY OF PARA-CYMENE

Thomas R. Fritsch, Lombard, and Mark C. Anderson, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 836,273, Sep. 26, 1977. This application Apr. 17, 1978, Ser. No. 896,967
Int. Cl.[2] C07C *7/13*
U.S. Cl. 260—674 A **10 Claims**



1. A process for the production and recovery of para-cymene from a mixture of cymene isomers which process comprises the sequential steps of:

(a) contacting said mixture with a crystalline aluminosilicate adsorbent, in an adsorption-separation zone, at conditions selected to effect the selective retention therein of para-cymene;

(b) withdrawing a para-cymene deficient raffinate stream from said adsorption-separation zone and contacting said

adsorbent with a desorbent to effect removal and recovery of para-cymene therefrom;
(c) introducing said raffinate stream into an aromatic isomerization reaction zone maintained at isomerization conditions which convert cymene isomers into para-cymene and which effect the production of olefinic hydrocarbons;
(d) hydrotreating the resulting isomerization reaction zone effluent, in a hydrotreating zone, at hydrotreating conditions selected to (i) provide a liquid-phase operation and (ii) saturate said olefinic hydrocarbons without substantial saturation of cymene isomers; and,
(e) introducing at least a portion of the resulting olefin-free reaction zone effluent into said adsorption-separation zone to recover additional para-cymene.

4,128,594
PROCESS FOR THE PURIFICATION OF ALKYL AROMATICS

Helmut Westernacher, Haltern, Fed. Rep. of Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 760,714, Jan. 19, 1977, abandoned. This application Apr. 18, 1978, Ser. No. 897,606
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1976, 2602069
Int. Cl.[2] C07C *7/01*
U.S. Cl. 260—674 A **5 Claims**

1. In a process for the purification of an impure alkyl aromatic compound, produced by a Friedel-Crafts reaction employing aluminum chloride reaction catalyst and a promoter, by the successive steps of phase separation of the reaction product to separate therefrom the major proportion of reaction catalyst, neutralization with anhydrous ammonia of residual catalyst complex and hydrogen chloride present in the separated impure alkyl aromatic compound, and filtration of the neutralized product, the improvement wherein the neutralization with ammonia is conducted at a temperature of 40°–70° C at pH of 7–9 and at a pressure of 0.5–25 bars.

4,128,595
ACETYLENE HYDROGENATION IN LIQUID PHASE WITH A LIQUID HYDROCARBON REACTION MEDIUM

Dean P. Montgomery, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 2, 1977, Ser. No. 792,734
Int. Cl.[2] C07C *11/04*
U.S. Cl. 260—677 H **5 Claims**

1. A process for the selective hydrogenation of acetylenic compounds in the liquid phase, which comprises contacting hydrogen and a gaseous hydrocarbon stream containing acetylene with an inert saturated liquid hydrocarbon reaction medium having a boiling range of about 150° F. (66° C.) to about 600° F. (316° C.) and with a supported catalyst comprising a Group VIII metal under hydrogenation conditions including a pressure sufficient to maintain said reaction medium in the liquid phase to hydrogenate at least a portion of the acetylenes contained in said stream.

4,128,596
ALKYLATION OF OLEFINS WITH PARAFFINS UTILIZING ALUMINUM HALIDE AND GROUP VA METAL HALIDE INTERCALATED IN GRAPHITE

Clifford E. Smith, and Hans D. Holtz, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

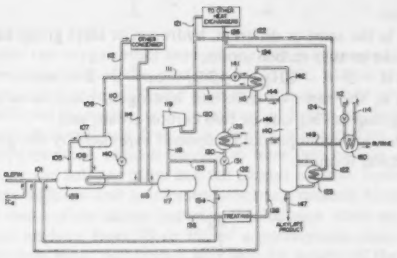
Division of Ser. No. 748,085, Dec. 6, 1976. This application Feb. 21, 1978, Ser. No. 879,571
Int. Cl.[2] C07C *3/56*
U.S. Cl. 260—683.53 **7 Claims**

1. A method for alkylation of olefins with paraffins comprising contacting said olefins and paraffins under alkylation conditions in the presence of a catalytic composition consisting essentially of intercalated structure of graphite containing aluminum halide and Group VA metal halide in the graphite lattice, the molar ratio of said Group VA metal halide to said aluminum halide being about 1.4:1 to about 0.15:1.

4,128,597
ALKYLATION PROCESS UTILIZING HYDROCARBON PHASE FOR COOLING AND COMPRESSED VAPOR FOR SUPPLYING HEAT TO DISTILLATION COLUMN

Richard H. Jones, South Euclid, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 742,949, Nov. 18, 1976, which is a continuation-in-part of Ser. No. 650,341, Jan. 19, 1976, abandoned, and Ser. No. 650,342, Jan. 19, 1976. This application Oct. 26, 1977, Ser. No. 845,762
Int. Cl.[2] C07C *3/54*
U.S. Cl. 260—683.62 **20 Claims**



1. A process for catalytic alkylation of isobutane with an olefin comprising the steps of:
(a) contacting said olefin with a molar excess of isobutane and inert alkanes in the presence of an acid catalyst in a reactor to form a reactor effluent containing alkylate, isobutane, acid catalyst and inert alkanes;
(b) separating said acid catalyst from said reactor effluent to form a hydrocarbon mixture;
(c) effecting a liquid vapor separation on a portion of said hydrocarbon mixture to obtain a liquid bottoms stream containing isobutane and alkylate and an overhead vapor stream containing isobutane and inert alkanes;
(d) heating in a distillation zone said liquid bottoms stream to separate a liquid bottoms product containing alkylate and a vaporous distillation effluent containing isobutane;
(e) passing a portion of said hydrocarbon mixture from step (b) as a cooling effluent in indirect heat exchange with said vaporous distillation effluent in an overhead condenser for said distillation zone to condense isobutane in said vaporous distillation effluent and to vaporize at least a portion of said cooling effluent;
(f) admixing said cooling effluent from step (e) with said portion of the hydrocarbon mixture of step (c) so that said cooling effluent is subjected to liquid-vapor separation along with said portion of the hydrocarbon mixture in step (c);
(g) compressing the overhead vapor stream produced in step (c) in a compressor to obtain a compressed vapor stream; and
(h) passing at least a portion of said compressed vapor stream in indirect heat exchange relation with a liquid separated from said distillation zone of (d) to condense at least a portion of the compressed vapor stream and to supply heat to said distillation zone.

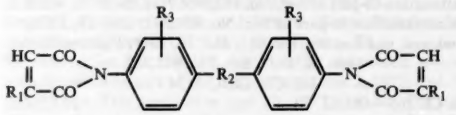
4,128,598

THERMOSETTING RESIN COMPOSITIONS HAVING EXCELLENT HIGH TEMPERATURE CHARACTERISTICS

Kiyoji Makino, Yokosuka, and Tsutomu Ohkawa, Yokohama, both of Japan, assignors to Toshiba Chemical Products Co. Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,769
Claims priority, application Japan, Jun. 25, 1976, 51-75096
Int. Cl.[2] C08L *63/02, 63/00*
U.S. Cl. 260—837 R **7 Claims**

1. A thermosetting resin composition which is essentially prepared from a polymeric reaction product obtained by mixing an addition product of at least one bismaleimide compound expressed by the general structural formula:



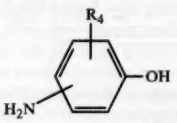
where:

R_1 is, the same or different, hydrogen or alkyl group having one or two carbon atoms,

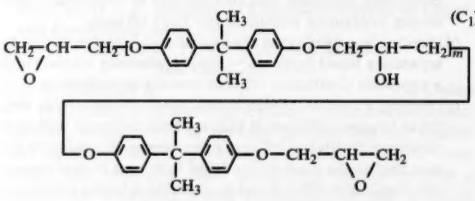
R_2 is —O—, —CH_2—, —SO_2— or —S—S—, and

R_3 is, the same or different, hydrogen, chlorine or alkyl group having one or two carbon atoms; and

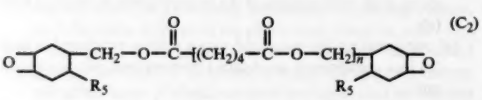
at least one aminophenol compound expressed by the general structural formula:



where R_4 is hydrogen, halogens, or alkyl group having one or two carbon atoms, wherein said addition product is formed of from 0.2 to 2 mols of said aminophenol per mol of said bismaleimide; with at least one epoxy compound selected from the group consisting of a compound expressed by the general structural formula:



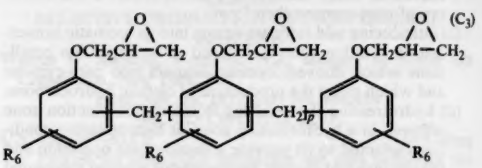
where *m* is 0 or an integer of 1 to 4, a compound expressed by the general structural formula:



where:

n is 0 or 1, and

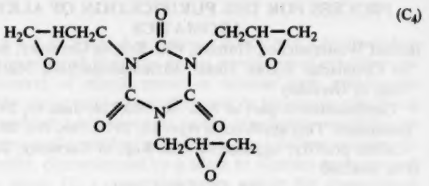
R_5 is, the same or different, hydrogen or methyl, a compound expressed by the general structural formula:



where:

p is 0, 1 or 2, and

R_6 is, the same or different, hydrogen, bromine or methyl, and a compound expressed by the general structural formula:



4,128,599

POLYAMIDES FOR EXTRUSION APPLICATIONS

Norman W. Thomas, Warren; Frank M. Berardinelli, Millington, both of N.J., and Robert Edelman, Staten Island, N.Y., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,384
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—857 R **12 Claims**

1. A process for preparing a polycarbodiimide modified tractable polyamide of increased melt strength, shear sensitivity and relative viscosity, from a reaction mixture of a tractable polyamide and at least one polycarbodiimide which process comprises incorporating into the reaction of, from about 99.5 to about 95% by weight of said mixture, of a tractable polyamide, having at least one carboxyl end group and at least one amine end group, from about 0.5 to about 5% by weight of said mixture of, at least one polycarbodiimide which polycarbodiimide both (a) is derived from at least one aromatic diisocyanate which is either unsubstituted or contains up to one methyl substituent on each aromatic ring, and (b) contains at least three carbodiimide units per polycarbodiimide molecule, by reacting the end groups of the polyamide, at a temperature not less than the melting point of the polyamide and less than the decomposition temperature of the polyamide and polycarbodiimide, with the carbodiimide groups of the polycarbodiimide, said modified tractable polyamide having a melt strength ratio of T_1/T_2, wherein T_1, is the time necessary to extrude a first three inch portion of a six inch continuous strand of molten polyamide, and T_2 is the time necessary to extrude the second three inches of the six inch continuous strand, of less than about 1.76 at 270° C., a relative viscosity, as determined from an 11%, by solution weight of a solution of the polyamide in formic acid, of about 75 to about 600 and utility in extrusion applications.

4,128,600

INTERPENETRATING DUAL CURE RESIN COMPOSITIONS

Earl Skinner, Wayzata; Marvin Emeott, Lake Elmo, and Allan Jevne, Anoka, all of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Jan. 14, 1977, Ser. No. 759,311
Int. Cl.[2] C08L 75/06
U.S. Cl. 260—859 R 12 Claims

5. An interpenetrating urethane-linking, radiation-sensitive resin composition comprising:

(a) from about 40% to about 90% by weight of a saturated polyol which is a hydroxy functional acrylic copolymer of:
(1) methyl methacrylate;
(2) butyl acrylate, and
(3) hydroxyethyl acrylate and,

(b) from about 10% to about 60% by weight of a reactive diluent selected from the group consisting of the fully substituted polyacrylates and polymethacrylates of polyfunctional alcohols, 2-ethylhexylacrylate, isodecylacrylate, diallyl maleate, styrene, divinylbenzene, vinyl acetate, and N-vinyl-2-pyrrolidone, and mixtures thereof; and,

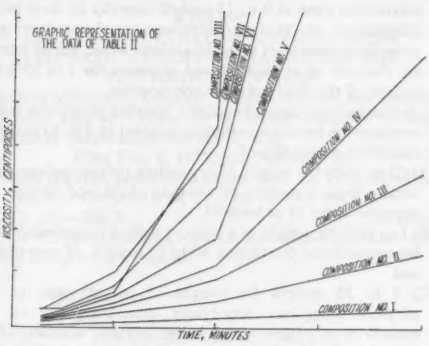
(c) from about 80% to about 120% on a hydroxylisocyanate equivalent basis of a polyisocyanate.

4,128,601

THICKENING AGENTS FOR LOW PRESSURE MOLDING COMPOSITIONS

John J. McCluskey, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 28, 1977, Ser. No. 772,781
Int. Cl.[2] C08L 67/06
U.S. Cl. 260—862 7 Claims



1. A moldable composition comprising:

(a) an unsaturated, crosslinkable polyester resin having an acid number of about 15 to about 45 and a molecular weight from about 1,300 to about 2,500;

(b) an ethylenically unsaturated monomer;

(c) a thermoplastic resin having an acid number up to about 3.5 and a molecular weight of about 80,000 to about 350,000 soluble in said monomer; and

(d) a thickening agent consisting essentially of at least one alkaline-earth metal hydroxide and zinc oxide in an amount sufficient to thicken said moldable composition, the amount of said zinc oxide being sufficient to retard the rate of thickening of said molding compound as compared to the rate at which the molding compound thickens in the absence of said zinc oxide.

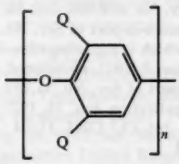
4,128,602

POLYPHENYLENE ETHER COMPOSITIONS CONTAINING RUBBER MODIFIED POLYSTYRENE

Arthur Katchman, Delmar, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 489,510, Jul. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 122,079, Mar. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 31,793, Apr. 24, 1970, abandoned. This application Jun. 23, 1977, Ser. No. 809,440
Int. Cl.[2] C08L 51/04
U.S. Cl. 260—876 R 19 Claims

1. A high impact thermoplastic composition comprising from 1 to 99% by weight of a polyphenylene ether having the repeating structural formula:



wherein the oxygen ether atom of one unit is connected to the benzene nucleus of the next adjoining unit, n is a positive integer and is at least 50, and each Q is a monovalent substituent selected from the group consisting of hydrogen, halogen, hydrocarbon radicals free of a tertiary alpha-carbon atom, halohydrocarbon radicals having at least two carbon atoms between the halogen atom and the phenyl nucleus, hydrocarbonoxy radicals and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atom and the phenyl nucleus, from 99 to 1% of a polystyrene resin, on a rubber-free basis, and from 0.1 to 30% by weight of the total weight of the composition of a rubber, said composition having a dispersed particulate rubber phase in which the particles have a maximum mean diameter of about 2 microns.

4,128,603

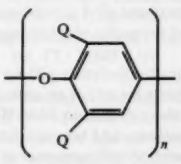
COMPOSITIONS COMPRISING POLYPHENYLENE ETHER AND RUBBER MODIFIED POLYSTYRENE

Arthur Katchman, Delmar, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 489,509, Jul. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 139,215, Apr. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 31,793, Apr. 24, 1970, abandoned. This application Jun. 23, 1977, Ser. No. 809,441
Int. Cl.[2] C08L 51/04
U.S. Cl. 260—876 R 14 Claims

1. A high impact strength thermoplastic composition comprising

(a) a polyphenylene ether having the repeating structural formula:



wherein the oxygen ether atom of one unit is connected to the benzene nucleus of the next adjoining unit, *n* is a positive integer and is at least 50, and each Q is a monovalent substituent selected from the group consisting of hydrogen, halogen,

hydrocarbon radicals free of a tertiary alpha-carbon atom, halohydrocarbon radicals having at least two carbon atoms between the halogen atom and the phenyl nucleus, hydrocarbonoxy radicals and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atom and the phenyl nucleus and

(b) a rubber modified polystyrene, said rubber modified polystyrene containing from not substantially less than about 22% to about 80% by weight of a particulate elastomeric gel phase dispersed in a polystyrene matrix.

4,128,604

POLYPHENYLENE ETHER COMPOSITIONS

Arthur Katchman, Delmar, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 489,508, Jul. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 319,159, Dec. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 122,079, Mar. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 31,793, Apr. 24, 1970, abandoned. This application Jun. 23, 1977, Ser. No. 809,442

Int. Cl.[2] C08L *51/04*

U.S. Cl. 260—876 R **19 Claims**

1. A high impact strength thermoplastic composition comprising

(a) a polyphenylene ether and

(b) a rubber modified polystyrene resin,

said composition having a dispersed particulate rubber phase in which the particles have a maximum mean diameter of about 2 microns, said composition containing not substantially less than about 22% by weight of a particulate rubber gel phase, on a polyphenylene ether-free basis, dispersed in a polystyrene matrix, and said rubber comprising a polybutadiene having a cis-1,4 content of at least 50% by weight and a vinyl group content of no more than 10% by weight of said polybutadiene.

4,128,605

PROCESS FOR PREPARING VINYL CHLORIDE RESIN-ACRYLIC GRAFT COPOLYMER COMPOSITION

Kazuo Kishida, Otake; Jinpee Kobayashi, Iwakuni, and Hajime Fukunaga, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 804,157

Claims priority, application Japan, Jun. 4, 1976, 51-65314

Int. Cl.[2] C08L *51/00*

U.S. Cl. 260—876 R **12 Claims**

1. A process for preparing vinyl chloride resin composition comprising the steps of:

(1) preparing an acrylic elastomer (A) by (a) polymerizing 30 to 50% by wt. of an aromatic vinyl monomer in the presence of a polyfunctional cross-linking agent having at least one allyl group and a carboxylate anion surfactant as an emulsifier at a pH maintained between 7.0–9.5 and then (b) graft-polymerizing 50 to 70% by wt. of an alkyl acrylate of 2 to 10 carbon atoms in the alkyl group onto said polymerized aromatic vinyl polymer in the presence of from 0.1 to 3 parts by wt. of a polyfunctional cross-linking agent with at least one allyl group based on the weight of the sum of said aromatic vinyl monomer and said alkyl acrylate;

(2) preparing a graft copolymer (B) by graft-polymerizing from 20 to 70 parts by wt. of an aromatic vinyl monomer and methyl methacrylate onto 30 to 80 parts by weight of said acrylic elastomer (A) wherein from 70% to 20% by wt. of said aromatic vinyl monomer is first graft-polymerized onto said elastomer (A) in the presence of an oil soluble initiator and then graft-polymerizing from 30 to 80% by wt. of methyl methacrylate onto said grafted elastomer; and

(3) mixing from 60 to 97 parts by wt. of a vinyl chloride polymer with 3 to 40 parts by wt. of said graft copolymer (B).

4,128,606

IMPACT-RESISTANT CHEMICALLY BLENDED PROPYLENE POLYMER COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Kunio Furutachi; Akifumi Kato; Mikio Nakagawa, all of Ohtake; Masaru Nakano, Iwakuni; Shunji Arita, Ohtake, and Aikich Yamamoto, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jan. 5, 1977, Ser. No. 757,026

Claims priority, application Japan, Feb. 13, 1976, 51-13915

Int. Cl.[2] C08F *297/08*

U.S. Cl. 260—878 B **8 Claims**

1. A process for preparing an impact-resistant chemically blended propylene polymer composition having an ethylene content of 3 to 40 mole%, which consists essentially of the following three steps:

(1) a first step of polymerizing propylene containing 0 to 1 mole% of another olefin in the presence of a catalyst composed of (a) a carrier-supported titanium catalyst component containing at least magnesium, halogen and titanium on the surface of the carrier and (b) an organoaluminum compound to form crystalline polypropylene having an isotactic index of at least 90 which accounts for 55 to 95% by weight of the final polymer composition;

(2) a second step of copolymerizing propylene and ethylene in the presence of the reaction product of the first step and the same catalyst while maintaining the content of propylene in the gaseous phase of the polymerization zone at 65 to 90 mole% therby to form a low-crystalline propylene-/ethylene copolymer having a propylene content of 60 to 85 mole% which accounts for 1 to 10% by weight of the final polymer composition; and

(3) a third step of polymerizing ethylene, or both ethylene and propylene in the presence of the reaction product of the second step and the same catalyst while maintaining the content of propylene in the gaseous phase of the polymerization zone at 0 to 15 mole% thereby to form polyethylene or an ethylene/propylene copolymer having a propylene content of up to 10 mole% which has an intrinsic viscosity of at least 2.6 and accounts for 1 to 35% by weight of the final polymer composition.

6. An impact-resistant chemically blended propylene polymer composition having an ethylene content of 3 to 40 mole%, and consisting essentially of

(A) 55 to 95% by weight of crystalline polypropylene containing 0 to 1 mole% of another olefin and having an isotactic index of at least 90,

(B) 1 to 10% by weight of a low-crystalline propylene/ethylene copolymer containing 60 to 85 mole% of propylene, and

(C) 1 to 35 mole% by weight of polyethylene or an ethylene/propylene copolymer containing up to 10 mole% of propylene which has an intrinsic viscosity of at least 2.6, the total proportion of (A), (B) and (C) being 100% by weight.

4,128,607

METHOD FOR THE PRODUCTION OF LOW DENSITY POLYETHYLENE

Tetsunosuke Shiomura; Youzou Kinoshita, both of Takaishi, and Yoshio Kokue, Izumi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Apr. 6, 1977, Ser. No. 785,252

Claims priority, application Japan, Apr. 6, 1976, 51-37765

Int. Cl.[2] C08F *4/02, 4/64, 210/00, 297/08*

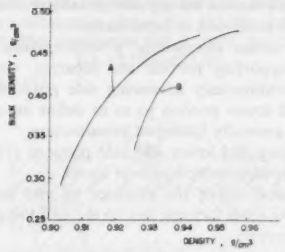
U.S. Cl. 260—878 B **1 Claim**

1. A method for the production of a low density ethylene copolymer of not higher than 0.945 g/cm^3 by copolymerizing ethylene and an α-olefin, which comprises:

(i) using a catalyst consisting essentially of (A) a catalyst component having titanium tetrachloride supported on a magnesium compound or a mixture or reaction product thereof with an aluminum compound and (B) an organoaluminum compound,

(ii) subjecting ethylene to pre-polymerization in the presence of said catalyst prior to the copolymerization, the amount of ethylene to be pre-polymerized being within the range of 1.0 to 50 g per 1.0 g of said catalyst component (A),

(iii) conducting the copolymerization of ethylene and an α-olefin in a two-step process of:



(a) first, conducting the copolymerization until polymers of 10 to 80% by weight based on a finally resulting polymer have been formed while controlling the copolymerization ratio of α-olefin to ethylene at less than 3.0% by weight, and

(b) completing the polymerization reaction while elevating the copolymerization ratio of α-olefin to ethylene to the range of 3.0 to 20% by weight, and

(iv) conducting said copolymerization in slurry state in the presence of a hydrocarbon solvent having a boiling point of not higher than 40° C. at temperature of not higher than 100° C.

4,128,608

2,2,6,6-TETRAMETHYL-4-PIPERIDYL SPIRO ALIPHATIC ETHERS AS STABILIZERS FOR SYNTHETIC POLYMERS

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

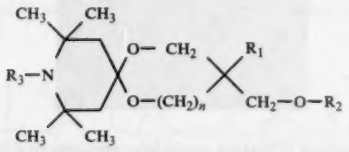
Filed Dec. 8, 1977, Ser. No. 858,774

Claims priority, application Japan, Dec. 24, 1976, 51-156075

Int. Cl.[2] **C07D** *211/44, 211/94, 401/12;* **C08K** *5/34*

U.S. Cl. 260—880 R **24 Claims**

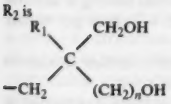
1. A 2,2,6,6-tetramethyl-4-piperidyl spiro aliphatic ether having the general formula:



wherein:

R_1 is selected from the group consisting of hydrogen, lower alkyl and lower hydroxyalkyl having one or two carbon atoms;

R_2 is



or

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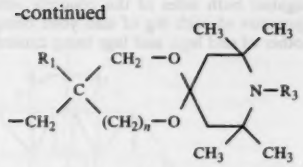


R_3 is selected from the group consisting of hydrogen and O·; and

n is 0 or 1.

20. An acrylonitrile-butadiene-styrene polymer having improved resistance to deterioration when heated at 300° F. comprising an acrylonitrilebutadiene-styrene polymer and an amount sufficient to improve resistance to deterioration of the resin of a compound in accordance with claim **1**.

4,128,609

METHOD OF ATTACHING HEELS TO SHOES

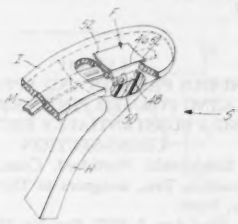
Francis F. H. Rawson, Loughborough, England, assignor to USM Corporation, Farmington, Conn.

Filed Sep. 20, 1977, Ser. No. 834,989

Claims priority, application United Kingdom, Jan. 26, 1977, 3052/77

Int. Cl.[2] **B29D** *3/00;* **B29F** *5/00*

U.S. Cl. 264—23 **8 Claims**



1. A method of attaching a thermoplastic heel to a shoe having an insole by means of a fastener having a head portion and a shank portion, the method comprising positioning the heel against the heel seat portion of the shoe, inserting the shank portion through the insole and into the thermoplastic material of the heel with the head portion overlying the insole, vibrating the fastener at an ultrasonic frequency to at least soften the material of the heel adjacent to the shank portion, and pressing the fastener into the heel to embed the shank portion in the material while it is at least softened said fastener having its shank portion formed with at least one hole extending transversely therethrough into which the softened heel material flows.

4,128,610

METHOD FOR CASTING CONCRETE STRUCTURES

Nils H. Ahlgren, 22 Skyttevägen, S-133 00 Saltsjobaden, Sweden

Filed Feb. 14, 1977, Ser. No. 768,691

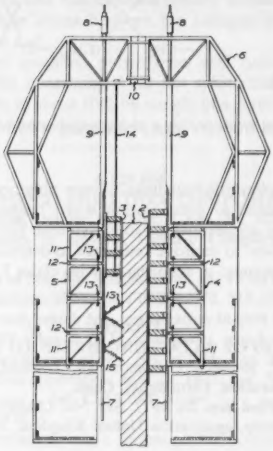
Claims priority, application Sweden, Feb. 20, 1976, 7602035

Int. Cl.[2] **E04B** *1/16*

U.S. Cl. 264—33 **7 Claims**

1. A method for the casting of concrete structures by means of moulds disposed at two opposite sides of the structure to be cast, said moulds being pressed against the concrete structure by the legs of a yoke construction which is arranged to be successively lifted by jacks cooperating with jack rods, said jack rods being fixed in place with respect to the concrete structure being cast during any lifting operation of said yoke construction; wherein the legs of said yoke construction are caused to produce a pressure, at least at their lower ends,

against both sides of the concrete structure being cast, the pressure of each leg of said yoke being directed toward the other of said legs, said legs being caused during lifting to slide



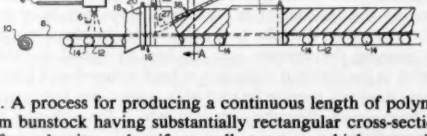
with respect to said jack rods; and wherein the weight of the yoke construction is carried by friction forces set up between the stationary jack rods and the concrete structure on both sides thereof.

4,128,611

CONTINUOUS PROCESS AND APPARATUS FOR PRODUCING FOAMED POLYMER BUNSTOCK HAVING A SUBSTANTIALLY RECTANGULAR CROSS-SECTION

Richard A. Kolakowski, Northford, Conn., and Richard M. Stroud, Houston, Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 7, 1977, Ser. No. 785,404
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—51 **10 Claims**



1. A process for producing a continuous length of polymer foam bunstock having substantially rectangular cross-section, uniform density and uniform cell structure which comprises the steps of:

advancing at a predetermined, constant rate a continuous conveyor surface along a predetermined path of travel, said conveyor surface comprising a lower supporting portion and separate upstanding portions on laterally opposite sides of said lower portion and defining together a generally trough-like moving mold for the developing foam product;

continuously depositing liquid polymerfoam forming mixture on the floor of said moving mold at a location near the entrance thereto;

allowing said foam-forming mixture to expand freely at least until the gel point is reached;

causing said expanding foam, at a point approaching the top of the foam rise and beyond that at which the gel point is reached but before said foam is no longer sufficiently mobile to be molded without distortion of cell structure, to contact the underside of a panel member having a width substantially co-extensive with that of said moving mold and being pivotally mounted, at the downstream end thereof, above said moving mold, said panel member depending from said pivotal mounting and floating freely on said rising foam in tangential contact therewith; and

adjusting the downward pressure exerted by said panel member so that it causes said rising foam to assume a substantially rectangular cross-section

said downward pressure being the sole restraining force applied to the surface of said foam during its entire passage through said trough-like moving mold.

6. An apparatus for the production of a continuous length of polymer foam bunstock having substantially rectangular cross-section which comprises in combination:

conveyor means comprising a continuously advancing lower supporting portion and separate, vertically disposed, continuously advancing side portions associated with said lower portion so as to define an open-topped mold of generally U-shaped cross-section;

means driving said lower and side portions synchronously along a predetermined path of travel.

means located above the entrance to said conveyor for dispensing foam forming mix on the said lower portion of said conveyor;

a panel member of a width substantially co-extensive with that of said open-topped mold having its end remote from the said foam dispensing means adjustably and pivotally mounted above said open top conveyor, said panel member depending downwardly from said pivotal mounting and adapted to make tangential contact on its underside with the surface of foam rising in said open-topped mold at a point approaching the top of the rise and beyond that at which the gel point is reached but before said foam is no longer sufficiently mobile to be molded without distortion of cell structure; and

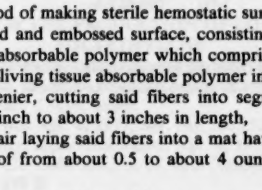
means located at the end of said conveyor for cutting foam bunstock into lengths of predetermined size and for removing said lengths from said conveyor.

4,128,612

MAKING ABSORBABLE SURGICAL FELT

Roy W. Roth, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 462,559, Apr. 19, 1974, Pat. No. 3,937,223.
This application Nov. 3, 1975, Ser. No. 628,029
Int. Cl.[2] B29D *3/02*
U.S. Cl. 264—126 **5 Claims**



1. A method of making sterile hemostatic surgical felt, having a textured and embossed surface, consisting entirely of a living tissue absorbable polymer which comprises:

spinning a living tissue absorbable polymer into fibers of 0.5 to 12 denier, cutting said fibers into segments of from about ¼ inch to about 3 inches in length,

randomly air laying said fibers into a mat having a uniform density of from about 0.5 to about 4 ounces per square yard,

heating and compressing with a texture surface to emboss said mat and bind the fibers to form a felt,

the heating, embossing and texturing causing a reduction in

the rate of blood penetration, and improving the adhesion to bleeding surfaces,

cutting to form individual felt hemostats,

, and, in any order, packaging in contamination resistant packages, and sterilizing.

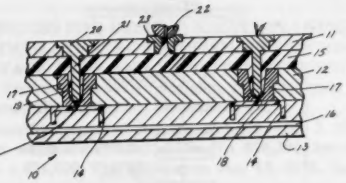
4,128,613
INJECTION MOLDING METHOD

David O. Allen, Wilmington, Ohio, assignor to Buckeye Molding Company, New Vienna, Ohio

Continuation of Ser. No. 644,832, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 483,086, Jun. 26, 1974, abandoned. This application Feb. 8, 1977, Ser. No. 766,657

Int. Cl.[2] B29F *1/05*

U.S. Cl. 264—161 **3 Claims**



1. An improved method of injection molding a molten resin comprising the steps of interposing between a mold chamber and a sprue passageway a gate having wall means defining a gate opening which has a length of perimeter greater than the circumference of a circular opening having a cross-sectional area equal to that of said gate opening, effecting a flow of said resin from said sprue passageway through said gate opening until said chamber is filled with resin, maintaining resin remaining in said sprue passageway immediately adjacent said gate in a molten state, cooling resin remaining in said gate sufficiently to avoid drooling, and thereafter separating resin filling said mold chamber from said gate and resin remaining therein.

4,128,614
HALOGENATED AROMATIC POLYESTER FIBERS PREPARED VIA DRY-SPINNING HAVING REDUCED SPIN-LINE STATIC GENERATION

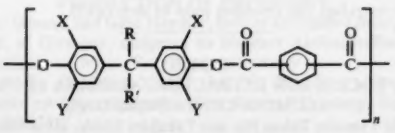
William C. Gilbert, Fairfield, Conn., assignor to Celanese Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 798,973

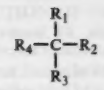
Int. Cl.[2] D01F *6/00*

U.S. Cl. 264—205 **13 Claims**

1. In a dry-spinning process for forming fibers of certain halogenated aromatic polyesters by extruding a solution of a halogenated aromatic polyester of the recurring structural formula:

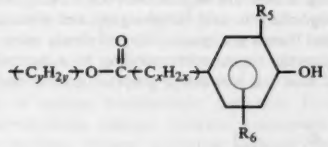


where X which may be the same or different is chlorine or bromine, Y which may be the same or different is hydrogen, chlorine or bromine, R and R′ may be the same or different and represent lower alkyl groups, hydrogen, or together constitute a cyclic hydrocarbon group, and n equals at least 25, while dissolved in methylene chloride, through an opening into an evaporative atmosphere for the methylene chloride; the improvement comprising incorporating an esterified hindered phenol having the structural formula:

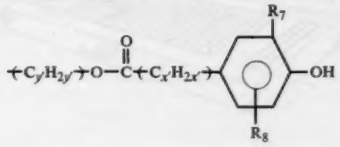


where

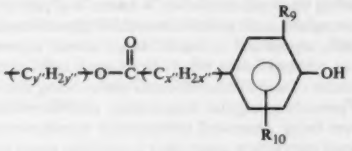
R_1 is



R_2 is

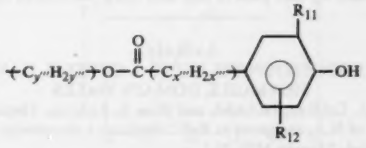


R_3 is



and

R_4 is



and where

x, x′, x″, x‴, y, y′, y″, y‴ represent an integer which can vary from 1 to 6 and R_5, R_6, R_7, R_8, R_9, R_{10}, R_{11} and R_{12} which may be the same or different represent a straight or branched chain hydrocarbon having from 1 to 6 carbon atoms, into said solution in an amount of from about 0.1 to about 2.5% by weight based on the weight of said dissolved halogenated aromatic polyester which serves to reduce the generation of spin-line static during the extrusion process.

4,128,615
METHOD FOR PROCESSING AN ELECTRIC SIGNAL USING ELASTIC SURFACE WAVES

Pierre Tournois, and Charles Maerfeld, both of Paris, France, assignors to Thomson-CSF, Paris, France

Division of Ser. No. 629,905, Nov. 7, 1975, abandoned. This application May 27, 1977, Ser. No. 801,250

Claims priority, application France, Nov. 8, 1974, 74 37079

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—313 **7 Claims**

1. A method for processing an electric signal by means of an

acoustic surface wave device, said device being of a type that comprises:

a piezoelectric substrate;

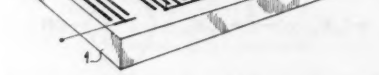
at least one electromechanical transducer for receiving said signal, termed the initial signal, and for generating elastic waves on the surface of said substrate;

means for exciting electromagnetic waves; and

means for fixing a potential pattern;

said method comprising the steps of:

producing a first interaction between a first elastic wave corresponding to said initial signal, and a second wave, selected from a group consisting of elastic wave and electromagnetic wave, corresponding to a second electric signal, said first interaction generating a time-independent



spatial potential pattern, representing the correlation function between said initial signal and said second signal, and fixed by said fixing means;

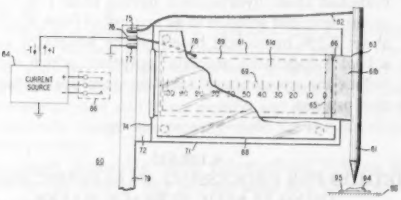
producing a second interaction between said pattern, a third wave, which is an acoustic wave corresponding to a third electric signal and a fourth wave, which is an acoustic wave corresponding to a fourth signal, the angular frequencies of said third and fourth waves being distinct from the preceding angular frequencies, said third and fourth waves being generated substantially simultaneously, said second interaction generating a resulting wave having an angular frequency distinct from the preceding angular frequencies and an amplitude representing the integral on the interaction zone of the product of said signal represented by said pattern and said third and fourth signals.

4,128,616

MICROPOSITIONERS USING A CRYSTAL HAVING MOVEABLE DOMAIN WALLS

Larry A. Coldren, Holmdel, and Ross A. Lemons, Tinton Falls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 11, 1977, Ser. No. 823,726
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—328 **19 Claims**



1. In combination,

means for receiving a specimen,

a body having a fixed end and a free end,

control means for providing relative motion between said specimen and an individual one of said ends, said body being comprised of a body of crystalline material having at least a first domain wall, said material being such that movement of said domain wall causes relative motion between said fixed and free ends, said control means comprising means for moving said domain wall, and

means for enabling the position of said domain wall to be observed,

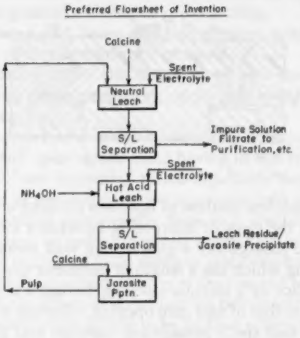
said combination characterized by a ruled scale disposed on said body perpendicular to the plane of said domain wall.

4,128,617

TREATMENT OF ZINC CALCINES FOR ZINC RECOVERY

Marcel F. DeGuire, Southbury, and John H. Wirag, III, Bethel, both of Conn., assignors to Newmont Exploration Limited, Danbury, Conn.

Filed Jul. 11, 1977, Ser. No. 814,659
Int. Cl.[2] C01G *9/06*
U.S. Cl. 423—106 **20 Claims**



1. A process for the treatment of zinc calcine containing zinc oxides, zinc sulfates and zinc ferrites for the recovery of zinc which comprises:

(a)(1) neutral leaching the zinc calcine with an effective volume of an aqueous sulfuric acid containing solution to dissolve a substantial amount of the zinc oxides and the zinc sulfates, and thereafter contacting the resulting pulp with an effective amount of a neutralizing agent to neutralize the acid content of the pulp, and

(2) separating the solids and liquid to produce an impure solution filtrate and a neutral leach residue;

(b) (1) hot acid leaching the neutral leach residue with an effective volume of aqueous sulfuric acid containing solution to dissolve a substantial amount of the zinc ferrites, and

(2) separating the solids and liquid to produce an acid leach solution and an acid leach residue, said acid leach residue containing jarosite precipitate recycled from step (c)(2);

(c)(1) contacting the acid leach solution with an effective amount of a neutralizing agent and in the presence of an effective amount of an alkali to precipitate the ferric iron as jarosite, and

(2) recycling the resulting pulp to step (a)(1).

4,128,618

PROCESS FOR EXTRACTING ALUMINA FROM ALUMINA-CONTAINING ORES

Koichi Yamada; Takuo Harato; Takahiro Ishida, all of Niihama, and Yasumi Shiozaki, Saijo, all of Japan, assignors to Sumitomo Aluminium Smelting Company, Ltd., Osaka, Japan

Filed Aug. 1, 1977, Ser. No. 820,897
Claims priority, application Japan, Aug. 6, 1976, 51-94280
Int. Cl.[2] C01F *7/06*
U.S. Cl. 423—119 **8 Claims**

1. In a process for extracting alumina from alumina-containing ores on a two-stream system by individually preheating a slurry of alumina-containing ores and an aqueous alkali solution each in preheaters of indirect heating, mixing the pre-

heated slurry with the preheated aqueous alkali solution, and extracting alumina from the alumina-containing ores in a digester which is either heated by direct injection of live steam or is a digester of the heat-insulated type, the improvement which comprises preparing the slurry of alumina-containing ores having a solid matter concentration of about 20% by weight or higher with water or a diluted aqueous alkali solution having an alkali concentration of not more than about 10 g/l in terms of M_2O, where M represents Na or K, preheating the slurry, mixing the preheated slurry with an aqueous alkali solution preheated as another stream as a decomposition solution, and extracting alumina from the ores, thereby completely or substantially preventing scale formation on an inside surface of the preheater for the slurry.

4,128,619
PROCESS FOR DESULFURIZATION USING PARTICULATE ZINC OXIDE SHAPES OF HIGH SURFACE AREA AND IMPROVED STRENGTH

Victor S. Robinson, Brooklyn Heights, N.Y., assignor to The New Jersey Zinc Company, Bethlehem, Pa.

Continuation-in-part of Ser. No. 801,498, May 3, 1977, abandoned, which is a division of Ser. No. 594,391, Jul. 9, 1975, Pat. No. 4,071,609. This application Jan. 13, 1978, Ser. No. 869,335

Int. Cl.² C01B *17/00*

U.S. Cl. 423—244 **6 Claims**

1. A process for desulfurizing sulfur-containing gases, said process including the steps of:

a. providing a bed of high surface area and high crush strength particulate zinc oxide formed by the steps of:
   (1) forming normal zinc oxide having a specific surface area less than 10 square meters per gram into pre-determined shapes without the addition of extraneous binding material;
   (2) exposing said normal zinc oxide shapes to a carbon dioxide-containing atmosphere including water vapor;
   (3) converting at least about 45% of said zinc oxide into basic zinc carbonate; and
   (4) decomposing substantially all of said basic zinc carbonate into particulate zinc oxide shapes such that said particulate zinc oxide shapes have a crushing strength between about five and about thirty times greater than the crushing strength of the pre-determined zinc oxide shapes;

b. passing said sulfur containing gas over said bed in order to remove the sulfur from said gas; and

c. collecting said desulfurized gas.

4,128,620
PRODUCTION OF PHOSPHINE

Jurgen Stenzel, and Gero Heymer, both of Erftstadt-Liblar, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 2, 1977, Ser. No. 830,160

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639941

Int. Cl.² C01B *25/00*

U.S. Cl. 423—299 **9 Claims**

1. A process for making phosphine, which comprises reducing, in a first step, anhydrous zinc phosphate to zinc phosphide by treatment with carbon at a temperature higher than 1000° C., and, in a second step, reacting the zinc phosphide formed in the first step with phosphoric acid, the resulting gaseous phosphine being collected, and the resulting zinc phosphate, which is obtained as a difficultly soluble precipitate, being dried, dehydrated and recycled to the first step.

4,128,621
PRODUCTION OF AMMONIA

Edwin H. Homeier, Maywood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 736,687, Oct. 28, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 846,852

Int. Cl.² C01C *1/04*

U.S. Cl. 423—362 **9 Claims**

1. A process for the production of ammonia which comprises reacting hydrogen and nitrogen at reaction conditions in the presence of a catalyst comprising an activated phthalocyanine, corrin or porphyrin of a transition metal, said catalyst having been activated prior to the hydrogen-nitrogen reaction by treatment with a reducing agent selected from the group consisting of sodium borohydride, potassium borohydride, lithium borohydride, calcium hydride, magnesium hydride, strontium hydride, sodium methylate, sodium ethylate, trimethyl aluminum chloride, triethyl aluminum chloride, tripropyl aluminum chloride, triethyl aluminum, tripropyl aluminum and tri-t-butyl aluminum.

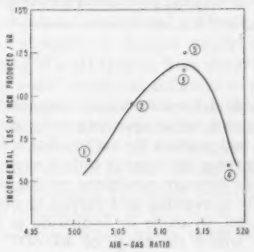
4,128,622
PROCESS FOR PRODUCING HYDROGEN CYANIDE

Karl D. Loos, II; Kenneth C. McCullough, both of Memphis, Tenn., and Don Q. Whitworth, Keller, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 27, 1976, Ser. No. 718,141

Int. Cl.² C01C *3/02*

U.S. Cl. 423—376 **7 Claims**



1. In a process for producing hydrogen cyanide by contacting in a converter in the vapor phase, ammonia, a hydrocarbon gas and an oxygen-containing gas which contain about 21% by volume oxygen, in the presence of a platinum-group metal catalyst at a temperature of from about 1000° C. to 1200° C. to produce an off-gas containing hydrogen cyanide, the improvement comprising

(1) feeding to said converter a ratio of oxygen-containing gas to hydrocarbon gas within the range of 4.5:1 to 5.5:1,
(2) feeding to said converter a ratio of oxygen-containing gas to ammonia within the range of 3.0:1 to 9.0:1,
(3) measuring the converter off-gas to determine the weight percent of the hydrogen cyanide present at these ratios and then calculating HCN production,
(4) varying the hydrocarbon gas feed while maintaining the oxygen-containing gas to ammonia ratio constant,
(5) continuing to vary the hydrocarbon gas feed until the highest calculated HCN production is obtained, and
(6) maintaining the hydrocarbon gas feed at the rate corresponding to the highest production of hydrogen cyanide in the off-gas.

4,128,623

MANUFACTURE OF A SOLUTION OF NITROSYLSULFURIC ACID IN SULFURIC ACID

Karl Schmeidl, Frankenthal; Wilhelm Brunkhorst, Limburgerhof, and Eberhard Michaelis, Weingarten, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,672
Int. Cl.[2] C01B *21/54*
U.S. Cl. 423—388 6 Claims

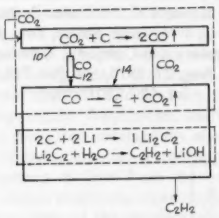
1. A process for the manufacture of a solution of nitrosylsulfuric acid in sulfuric acid by reacting nitric acid with sulfur in sulfuric acid or oleum, wherein less than 0.33 gram atom of sulfur is employed per mole of nitric acid and after completion of the reaction the free nitric acid still present in the nitrosylsulfuric acid solution is reduced with a lactone.

4,128,624

METHOD FOR INTRODUCING CARBON INTO EVACUATED OR PRESSURIZED REACTION VESSELS AND REACTION PRODUCTS THEREFROM

Murry A. Tamers, 14131 Cypress Ct., Miami Lakes, Fla. 33014

Continuation-in-part of Ser. No. 572,165, Apr. 28, 1975, Pat. No. 4,009,219. This application Oct. 20, 1975, Ser. No. 623,943
The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.
Int. Cl.[2] C01B *31/30, 31/02;* C09C *1/48*
U.S. Cl. 423—439 20 Claims



1. The method for introducing elemental carbon in solid form in a reaction vessel operating under pressure other than atmospheric and reacting the carbon that is formed to a metal carbide comprising introducing carbon monoxide in a gaseous state under the pressure conditions existing within the reactor and thermally converting said carbon monoxide in the presence of lithium, its oxide or hydroxide as the catalyst at a temperature within the range of 400–900° C. to elemental carbon and carbon dioxide under non-oxidizing conditions existing within the reactor, and removing carbon dioxide that is formed, leaving the elemental carbon in solid form as a reactant, reacting the carbon with lithium along or with lithium in combination with other alkali or alkaline earth metals at a temperature within the range of about 700°–1000° C. to form the corresponding carbides.

4,128,625

PROCESS FOR SYNTHESIZING DIAMONDS

Hiroshi Ishizuka, 19-2 Ebara 6-chome, Shinagawa-ku Tokyo, Japan

Filed Oct. 13, 1977, Ser. No. 841,715
Claims priority, application Japan, Oct. 18, 1976, 51-125212
Int. Cl.[2] C01B *31/06*
U.S. Cl. 423—446 4 Claims

1. In the process for synthesizing diamonds by subjecting in a reaction vessel a non-diamond material carbon and a solvent-catalyst metal to a high pressure-high temperature condition in diamond-stable region of carbon phase diagram, the improvement comprising the material carbon being initially isolated from the solvent-catalyst metal by a thin plate of a metal selected from the group consisting of copper, gold, silver and an alloy thereof, said thin metal plate melting partially under said condition to allow initiation of nucleation for diamond formation in a limited area increasing the size of the diamonds obtained.

4,128,626

PURIFICATION OF GASEOUS HYDROGEN CHLORIDE

Dibrendra R. Merchant, Paducah, Ky., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 153,839, Jun. 16, 1971, abandoned. This application Apr. 26, 1973, Ser. No. 354,715
Int. Cl.[2] C01B *7/08*
U.S. Cl. 423—488 6 Claims

1. A process for purifying gaseous hydrogen chloride containing hydrogen fluoride contamination which comprises contacting with solid, particulate, substantially anhydrous calcium chloride a gaseous mixture of hydrogen chloride containing from 0.1 to about 5 percent by weight of hydrogen fluoride, at a temperature within the range of about 50° F. to about 120° F., to effect substantial removal of the hydrogen fluoride from the gaseous hydrogen chloride, whereby the hydrogen fluoride content thereof is reduced to less than 0.01 weight percent.

4,128,627

SYNTHESIS OF HYDROGEN PEROXIDE

Paul N. Dyer, Horsham, and Fred Moseley, Cobham, both of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 4, 1977, Ser. No. 774,577
Claims priority, application United Kingdom, Mar. 9, 1976, 9351/76
Int. Cl.[2] C01B *15/02*
U.S. Cl. 423—584 9 Claims

1. In a process for producing hydrogen peroxide wherein a gaseous mixture comprising hydrogen and oxygen are contacted with a catalyst in the presence of water and an organic solvent, the improvement for reducing the risk of danger to explosion in said process which comprises:

employing an organic solvent which is immiscible with water and unreactive with hydrogen peroxide under the contacting conditions, and the distribution coefficient for hydrogen peroxide between water and said organic solvent is greater than one;

employing a catalyst of the formula L_2MX_2 wherein L is a ligand represented by the formula $AR_1R_2R_3$ wherein R_1R_2 and R_3 are alkyl, cycloalkyl or aryl groups, hydrogen and halogen, and A is a Group 5b element selected from the group consisting of nitrogen, phosphorus and arsenic, M is Group 8 metal and X is halogen, said catalyst being soluble in said organic solvent and insoluble in water; and

employing a gaseous mixture which is nonignitable under the process conditions.

4,128,628

AUTOMATED IMMUNOASSAY

Gary L. Brooker; Wesley L. Terasaki, and Michael G. Price, all of Charlottesville, Va., assignors to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation-in-part of Ser. No. 666,302, Mar. 12, 1976, Pat. No. 4,022,577, and a continuation-in-part of Ser. No. 730,630, Oct. 7, 1976. This application Feb. 3, 1977, Ser. No. 765,348
Int. Cl.[2] A61B *10/00;* G01N *33/00*
U.S. Cl. 424—1 16 Claims

1. An automated immunoassay apparatus which comprises:

means for time controlled incubation of a multiplicity of sample solutions, each of which comprises a mixture of (a) a sample, possibly containing an antigen or antibody intended to be assayed, (b) a solution of a known concentration of a tagged antigen or tagged antibody, and when

assaying for antigen, optionally (c) a solution of a known titer of an antibody reactable with said antigen;

activating detector means for determining the presence of the incubated sample and for activating a timing means upon detection of said sample at a detection station;

means for introducing said incubated sample into said activating detector means;

timing means, which is activatable by said activating detector means when said detector means detects the presence of the incubated sample at a detection station, for generating control signals at predetermined time sequences;

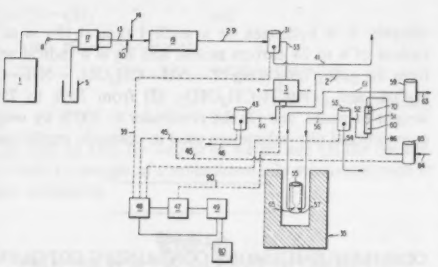
means for separating said incubated sample into a first portion containing antigen or antibody which has not been complexed during the said incubation, and a second portion containing antigen or antibody which has been complexed during said incubation;

means for introducing one of said portions from said separating means into a measuring detector means;

measuring detector means for detecting the amount of tagged material in said portion while said portion is maintained in a virtually static condition;

recording means coupled to said detector means for recording the amounts of tagged material in said measuring detector means;

means for isolating said incubated sample from additional sample solutions introduced into said apparatus for assay, wherein said isolating means is activatable by a control signal emitted from said timing means, whereby said isolating means isolates the system at a first predetermined



signal from said timing means, and whereby said isolating means reconnects the system to said incubation means at a second predetermined signal from said timing means, wherein the second predetermined time period is set so as to enable sufficient time to complete said measurement before the next incubated sample arrives in the said detector means for the next sequential measurement; and

means for flushing said portion from said system after said measurement thereof so as to prepare said detector for the next sequential sample for said measurement.

10. A method for continuous immunoassay, which comprises:

incubating for a predetermined time period, a multiplicity of sample solutions, each of which comprises a mixture of (a) a sample possibly containing an antigen intended to be assayed; (b) a solution of a known concentration of a tagged antigen; and when assaying for antigen, optionally, (c) a solution containing a known titer of antibody reactable with said antigen, the concentration of said antibody being selected so as to form an incubated sample containing an antibody-antigen complex, and possibly containing unreacted antigen and tagged antigen, if said sample contains an antigen;

directing said incubated sample into an activating detector which is capable of determining the presence of said sample and activating,

activating a timing means upon detection of said sample in said detector;

isolating said incubated sample from any additional samples being incubated on a predetermined signal from said timing means;

separating said incubated solution into a first portion containing an antigen or antibody which has not been complexed during the said incubation and a second portion containing antigen or antibody which has been complexed during said incubation;

directing one of said portions into a measuring detector, detecting the amount of tagged material in said portion while said portion is maintained in a virtually static condition, and recording said measurement;

evacuating said portion to waste;

directing a subsequent incubated sample into said activating detector on a second predetermined signal from said timing means so that the next subsequent incubated sample to be assayed arrives in the activating detector for the next measurement after the previous measurement is completed; and

comparing the measurement with precalibrated values to determine the quantity of antigen being assayed.

4,128,629
EXTRACTION-FREE CORTISOL ASSAY

Emmet W. Eldred, North Attleboro, and Hubert J. P. Schoemaker, Newton, both of Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,992
Int. Cl.[2] G01N *33/16*
U.S. Cl. 424—1 **8 Claims**

1. An immunoassay for determining the concentration of cortisol in a serum sample, the assay comprising the steps of:

(a) incubating the sample, labeled cortisol, and an effective amount of deblocking agent in an aqueous medium with a composite comprising anti-cortisol antibodies fixed onto the surfaces of a negatively charged support material, the incubation being at a pH ranging from about 4.0 to about 6.5 and being under conditions sufficient to result in the formation of immunochemical complexes on the composite, some of which complexes include labeled cortisol;

(b) separating the composite from the incubation medium;

(c) determining the amount of label on the separated composite or in the remaining incubation medium; and

(d) relating the determination of step (c) to a standard to determine the cortisol concentration in the sample.

4,128,630
COSMETICS AND PROCESS FOR PREPARATION THEREOF

Katsutake Hayashi; Tutomu Saitoh, both of Tokyo; Katsuyuki Yomogida, and Hiromasa Saito, both of Yokohama, all of Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1977, Ser. No. 785,253
Claims priority, application Japan, Apr. 6, 1976, 51-38660
Int. Cl.[2] A61K *7/035*
U.S. Cl. 424—69 **16 Claims**

1. A process for preparing a cosmetic powder which comprises treating an inorganic pigment powder with a metal ion blocking agent, dehydrating and drying the treated powder, treating the inorganic pigment powder with a metallic soap before or after treatment with the metal ion blocking agent, and blending the resulting pigment with a perfume.

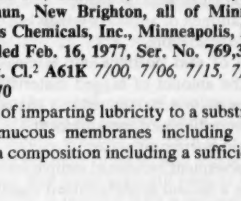
10. A cosmetic comprising an inorganic pigment powder treated with both a metal ion blocking agent and a metallic soap, and a perfume blended therewith.

4,128,631
METHOD OF IMPARTING LUBRICITY TO KERATINOUS SUBSTRATES AND MUCOUS MEMBRANES

Larry D. Lundmark, Richfield; Allan Melby, Andover, and Ho-Ming Chun, New Brighton, all of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Feb. 16, 1977, Ser. No. 769,354
Int. Cl.[2] A61K *7/00, 7/06, 7/15, 7/48*
U.S. Cl. 424—70 **4 Claims**

1. A method of imparting lubricity to a substrate comprising skin, hair or mucous membranes including contacting the substrate with a composition including a sufficient amount of a salt of



wherein x has a value such that the molecular weight of the anionic portion of the polymer is from about 1,000,000 to about 5,000,000 to achieve a lubricated feel upon the contacted substrate.

4,128,632
SOLUBILIZATION OF RAFOXANIDE

Pak-Kan A. Lo, Edison, and James B. Williams, Freehold, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1978, Ser. No. 876,968
Int. Cl.[2] A61K *31/79, 31/165*
U.S. Cl. 424—80 **7 Claims**

1. A process for the preparation of an aqueous solution of a Rafoxanide-polyvinylpyrrolidone complex which comprises:
(a) combining the Rafoxanide and polyvinylpyrrolidone in a mixture of acetone or glycerolformal and water;
(b) agitating the mixture until a solution is achieved;
(c) removing the acetone or optionally removing the glycerolformal; and
(d) if necessary, diluting the solution to the desired volume with water.

4,128,633
PROCESS FOR PREPARING PVP-IODINE COMPLEX

Donald H. Lorenz, Basking Ridge, N.J., and Earl P. Williams, Pen Argyl, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,520
Int. Cl.[2] A61K *31/79, 33/18*
U.S. Cl. 424—80 **5 Claims**

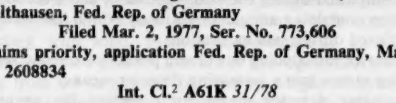
1. An improved in situ process of forming a PVP-iodine complex powder which is stable for prolonged periods of time at a high level of iodine power, but which requires a reduced amount of iodine to form said complex at said level which comprises the following sequence of steps in combination:
(a) suspension polymerizing vinylpyrrolidone in a solvent in which said vinylpyrrolidone is miscible but in which PVP is insoluble to form a slurry of polyvinylpyrrolidone powder in said solvent,
(b) adding free water to said slurry in an amount of about 1-10% by weight of said polyvinylpyrrolidone thereby to form polyvinylpyrrolidone powder having a predetermined concentration of water therein, and,
(c) adding finely divided elemental iodine to said slurry in an amount of about 5-25% by weight based on the complex at a temperature of about 65-85° C. and for a time sufficient to form said desired complex.

4,128,634
COSMETIC EMULSIONS CONTAINING COPOLYMERS OF ALKYL(METH)ACRYLATES AND MONO-(N-HYDROXYALKYL) OR BIS-(N-HYDROXYALKYL) (METH)ACRYLAMIDES

Brigitte Hase, Erkrath; Joachim Galinke, Langenfeld, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,606
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608834
Int. Cl.[2] A61K *31/78*
U.S. Cl. 424—81 **10 Claims**

1. A cosmetic emulsion of the water-in-oil type, comprising (1) from 2% to 20% by weight of statistical copolymers which are composed, in the molar ratio of (I) to (II) of 2:1 to 20:1, of units of the general formulae



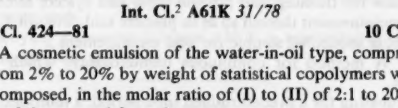
wherein X is hydrogen or a methyl radical, R_1 is an alkyl radical of 6 to 24 carbon atoms, and R_2 is a radical selected from the group consisting of —NH—CH_2OH, —NH—CH_2CH_2OH, and —$N(CH_2CH_2OH)_2$, (2) from 20% to 75% by weight of water, and (3) the remainder to 100% by weight of conventional oily substances used in cosmetic emulsions.

4,128,635
COSMETIC EMULSIONS CONTAINING COPOLYMERS OF ALKYL (METH) ACRYLATES AND MONO- OR POLYHYDROXYALKYL (METH) ACRYLATES

Brigitte Hase; Christian Hase, both of Erkrath; Joachim Galinke, Langenfeld, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,607
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608875
Int. Cl.[2] A61K *31/78*
U.S. Cl. 424—81 **10 Claims**

1. A cosmetic emulsion of the water-in-oil type, comprising (1) from 2% to 20% by weight of statistical copolymers which are composed, in the molar ratio of (I) to (II) of 2:1 to 20:1, of units of the general formulae



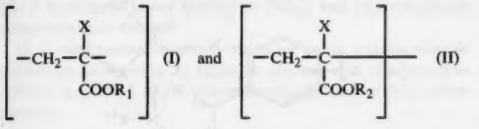
wherein X is hydrogen or a methyl radical, R_1 is an alkyl radical of 6 to 24 carbon atoms, and R_2 is a radical selected from the group consisting of —CH_2—CH_2OH, —CH_2—CH(OH)—CH_3, —CH_2—CH(OH)—CH_2OH, and —CH_2—CH_2O—CH_2CH_2OH, (2) from 20% to 75% by weight of water, and (3) the remainder to 100% by weight of conventional oily substances used in cosmetic emulsions.

4,128,636
COSMETIC EMULSIONS CONTAINING COPOLYMERS OF 2-HYDROXY-3-HYDROXYALKYL-AMINOPROPYL(METH)ACRYLATES AND ALKYL (METH)ACRYLATES

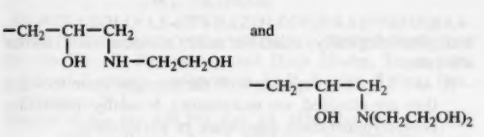
Brigitte Hase, Erkrath; Joachim Galinke, Langenfeld, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,608
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612886
Int. Cl.[2] A61K *31/78*
U.S. Cl. 424—81 10 Claims

1. A cosmetic emulsion of the water-in-oil type, comprising (1) from 2% to 20% by weight of statistical copolymers which are composed, in the molar ratio of (I) to (II) of 2:1 to 20:1, of units of the general formulae



wherein X is hydrogen or a methyl radical, R_1 is an alkyl radical of 6 to 24 carbon atoms, and R_2 is a radical selected from the group consisting of



(2) from 20% to 75% by weight of water, and (3) the remainder to 100% by weight of conventional oily substances used in cosmetic emulsions.

4,128,637
PROCESS FOR PRODUCING THYMOSIN

Robert Naylor, Glendale, and Howard F. Coyer, Wauwatosa, both of Wis., assignors to Pabst Brewing Company, Milwaukee, Wis.

Continuation of Ser. No. 669,862, Mar. 24, 1976, abandoned.
This application Jun. 23, 1977, Ser. No. 809,083
Int. Cl.[2] A61K *35/26, 35/56, 37/24*
U.S. Cl. 424—95 2 Claims

1. In a process for producing thymosin-fraction 3 wherein calf thymus glands are extracted in aqueous saline solution, undissolved material is removed, the resultant liquid material is heated, after heating the resultant product is cooled, the precipitate formed on cooling is removed, acetone is added to the resultant liquid in sufficient amount to precipitate thymosin-fraction 3 and the resultant precipitate is recovered, the improvement which comprises in combination:

(a) grinding calf thymus glands to a coarse state with a meat grinder,
(b) mixing the ground glands with an 0.15M sodium chloride solution, thereby forming a suspension,
(c) filtering the resultant suspension on a filter press with the aid of a filter aid,
(d) heating the resultant filtrate instantaneously to 80°–85° C. by injecting steam under superatmospheric pressure into a flowing stream of the filtrate,
(e) maintaining the said temperature of 80°–85° C. for a period of approximately 1–2 minutes, said period being at least sufficient to denature the undesired protein but not long enough to denature thymosin,
(f) rapidly cooling the resultant product,
(g) filtering off the resultant precipitate,
(h) concentrating the filtrate to approximately half its volume,
(i) adding acetone to the concentrated filtrate in sufficient amount to precipitate thymosin-fraction 3, and
(j) recovering the resultant precipitate.

4,128,638
NONA- AND DECA-PEPTIDE AMIDE DERIVATIVES DEMONSTRATING HIGH OVULATION INDUCING ACTIVITY

Keith Moody, Watsonia, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed Apr. 5, 1976, Ser. No. 673,545
Claims priority, application Australia, Apr. 15, 1975, PC1247
Int. Cl.[2] A61K *37/02;* C07C *103/52*
U.S. Cl. 424—177 14 Claims

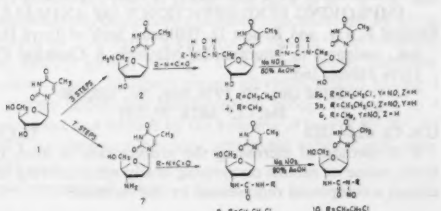
1. A peptide amide derivative selected from the group consisting of:

L-pyroglutamyl-L-histidyl-L-tryptophanyl-L-seryl-L-tyrosyl-β-alanyl-L-leucyl-L-arginyl-L-prolyl-glycinamide;
L-pyroglutamyl-L-histidyl-L-tryptophanyl-L-seryl-L-tyrosyl-glycyl-L-leucyl-L-arginyl-L-prolyl-alaninamide;
L-pyroglutamyl-L-histidyl-L-tryptophanyl-L-seryl-L-tyrosyl-glycyl-L-leucyl-L-arginyl-L-prolyl-sarcosinamide;
L-pyroglutamyl-L-histidyl-L-tryptophanyl-L-seryl-L-tyrosyl-β-alanyl-L-leucyl-L-arginyl-L-proline N-methylamide;
L-pyroglutamyl-L-histidyl-L-tryptophanyl-L-seryl-L-tyrosyl-β-alanyl-L-leucyl-L-arginyl-L-proline N-ethylamide;
L-pyroglutamyl-L-histidyl-L-tryptophanyl-L-seryl-L-tyrosyl-β-alanyl-L-leucyl-L-arginyl-L-proline N-n-propylamide;
and L-pyroglutamyl-L-histidyl-L-tryptophanyl-L-seryl-L-tyrosyl-β-alanyl-L-leucyl-L-arginyl-L-proline pyrrolidide.

4,128,639
NITROSOUREA ANALOGS OF THYMIDINE

Tai-Shun Lin, North Haven; Paul H. Fischer, North Branford; William H. Prusoff, Branford, and George T. Shiau, New Haven, all of Conn., assignors to Research Corporation, New York, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,453
Int. Cl.[2] A61K *31/70;* C07H *17/00*
U.S. Cl. 424—180 11 Claims



7. A pharmaceutical composition containing a compound selected from the group consisting of:

5'-[3-(2-chloroethyl)-nitrosoureido]-5'-deoxythymidine,
5'-(3-methyl-3-nitrosoureido)-5'-deoxythymidine,
3'-[3-(2-chloroethyl)-3-nitrosoureido]-3'-deoxythymidine,
3'-(3-methyl-3-nitrosoureido)-3'-deoxythymidine,

and a pharmaceutically acceptable carrier.

4,128,640
FEED FOR POULTRY

Samuel Klein, 1814 Manor Dr., Union, N.J. 07083

Continuation-in-part of Ser. No. 676,985, Apr. 14, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 851,917
Int. Cl.[2] A61K *35/78;* A23K *1/14, 1/165*
U.S. Cl. 424—195 3 Claims

1. A feed supplement for poultry effective to decrease the cholesterol content of eggs comprising the following composition:

Capsicum pods	12 parts
Powered licorice	12
Parsley	6
Elder flowers	1
Fenugreek	1
Rose hips	1
Dulse	1
Devil's apron	2

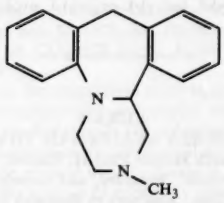
2. The method of decreasing the cholesterol content of eggs comprising feeding a cholesterol decreasing effective amount of the composition of claim 1 to poultry.

4,128,641
TETRACYCLIC PSYCHOTROPIC DRUG

Turan M. Itil, Tarrytown, N.Y., assignor to HZI Research Center Inc., Tarrytown, N.Y.

Continuation-in-part of Ser. No. 600,597, Jul. 31, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,663
Int. Cl.[2] A61K *31/495*
U.S. Cl. 424—250 10 Claims

1. A method of treating psychiatric patients exhibiting psychotic behavior, and in particular a schizophrenic symdrome which comprises administering to such patient a therapeutically-effective amount of a compound having the formula

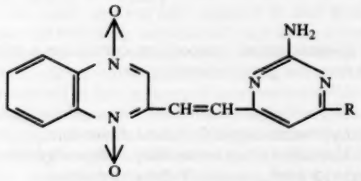


4,128,642
METHOD OF PROMOTING GROWTH AND IMPROVING FEED EFFICIENCY OF ANIMALS

Richard E. Ivy, and Robert D. Williams, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 20, 1976, Ser. No. 752,596
Int. Cl.[2] A61K *31/505*
U.S. Cl. 424—251 11 Claims

1. A method of increasing the growth rate of fowl, ruminants, swine or rabbits comprising orally administering to the animal a compound represented by the formula:



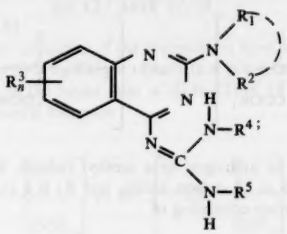
where R is hydrogen or an alkyl group of from 1 to 4 carbon atoms at a dosage of from about 10 to about 150 g per ton of feed rations.

4,128,643
4-QUINAZOLINYL-GUANIDINES

Wulf Merkel, Bad Soden am Taunus; Hans G. Alpermann, Königstein, Taunus; Karl Geisen, Frankfurt am Main; Norbert Kothe, Kronberg, Taunus, and Walter Ried, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,918
Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623846
Int. Cl.[2] C07D *413/04;* A61K *31/505*
U.S. Cl. 424—251 6 Claims

1. A (2-amino-4-quinazolinyl)-guanidine of the formula



and physiologically tolerable acid addition salts thereof wherein

R^1 and R^2, taken together with the nitrogen atom to which they are attached, are morpholino, N-methyl piperazino, N-benzylpiperazino, piperidins, or pyrrolidino;

R^3 is hydrogen, halogen, $-CF_3$, $-CCl_3$, alkyl alkoxy, alkylthio, each having from 1 to 3 carbon atoms phenoxy, phenyl, phenylthio, or dialkylamino having up to 8 carbon atoms altogether and

n is an integer from 1 to 4, or R_3 is a fused benzo group; and

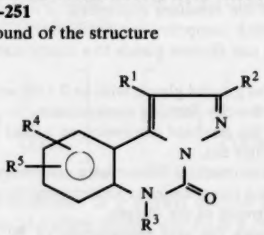
R^4 and R^5 are hydrogen, alkyl having 1 to 4 carbon atoms, cyclopentyl, cyclohexyl, or benzyl.

4,128,644
PYRAZOLO(1,5-C)QUINAZOLINE DERIVATIVES AND RELATED COMPOUNDS

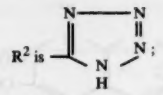
B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 29, 1977, Ser. No. 820,289
Int. Cl.[2] A61K *31/505;* C07D *403/14*
U.S. Cl. 424—251 14 Claims

1. A compound of the structure

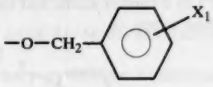


wherein R^1 represents hydrogen, lower alkyl, phenyl, or phenyl substituted with mono-lower alkyl, di-lower alkyl, or monohalo,



R^3 is hydrogen, lower alkyl, benzyl, phenyl or phenyl substituted by a single substituent selected from the group consisting of lower alkyl, halo, trifluoromethyl or lower alkoxy;

R^4 and R^5 may be the same or different and are hydrogen, lower alkyl, lower alkoxy, hydroxy, lower alkanoyloxy,



(X_1 is hydrogen, lower alkoxy, or NO_2); and physiologically acceptable salts thereof.

13. A pharmaceutical composition for use in treating allergic conditions comprising an effective amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4,128,645

4H-PYRAZOLO[1,5-a]PYRAZOLO[4',3':5,6]PYRIDO[3,4-e]PYRIMIDIN-5(8H)ONE AND DERIVATIVES THEREOF

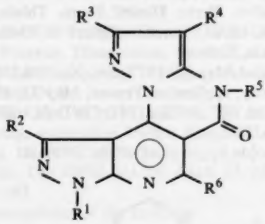
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 659,291, Feb. 19, 1976, Pat. No. 4,070,466. This application Sep. 1, 1977, Ser. No. 829,839

Int. Cl.[2] A61K *31/415;* **C07D** *471/04*

U.S. Cl. 424—251 **10 Claims**

1. A compound of the formula

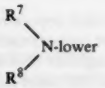


wherein R^1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, benzoyl or substituted benzoyl;

R^2, R^4 and R^6 each is hydrogen or lower alkyl;

R^3 is hydrogen, lower alkyl or phenyl;

R^5 is amino-lower alkylene or



alkylene wherein R^7 and R^8 each is lower alkyl; the substituent on said substituted benzoyl being halogen, lower alkyl or lower alkoxy, and physiologically acceptable acid addition salts thereof.

10. A method for treating inflammatory conditions which comprises administering to a mammal suffering therefrom a composition comprising about 10 to 250 mg. of a compound of claim 1 and a physiologically acceptable carrier therefor.

4,128,646

PYRIMIDO[5,6-b]QUINOXALINE-4-(3H)-ONE-2-CARBOXYLIC ACID COMPOUNDS

Yasuhiro Morinaka, and Kazuo Takahashi, both of Amimachi, Japan, assignors to Mitsubishi Yuka Pharmaceutical Co., Ltd., Tokyo, Japan

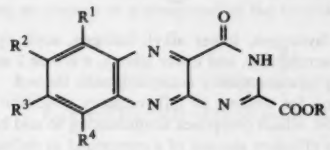
Filed Dec. 28, 1977, Ser. No. 865,135

Claims priority, application Japan, Dec. 28, 1976, 51-158332; Nov. 30, 1977, 51-143458

Int. Cl.[2] A61K *31/505;* **C07D** *487/04*

U.S. Cl. 424—251 **4 Claims**

1. A Substituted pyrimido[5,6-b]quinoxaline-4(3H)-one-2-carboxylic acid compound represented by the formula

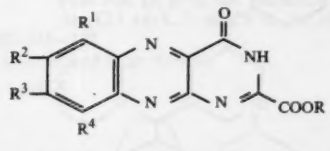


(I)

wherein: R designates a member selected from the group consisting of hydrogen, alkyl groups having 1 to 4 carbon atoms, benzyl group, and phenyl group; and each of R^1, R^2, R^3, and R^4 independently designates a member selected from the group consisting of hydrogen, alkyl groups having 1 to 4 carbon atoms, alkoxy groups having 1 to 4 carbon atoms, halogens, benzyloxy group, hydroxy group, alkylthio groups having 1 to 4 carbon atoms, and alkylenedioxy groups having 1 to 4 carbon atoms and formed by the bonding of two of R^1, R^2, R^3, and R^4, or a pharmacologically acceptable salt of said compound.

3. A medicinal composition useful in the treatment of allergic asthma which comprises

a pharmacologically active amount of a substituted pyrimido[5,6-b]quinoxaline-4(3H)-one-2-carboxylic acid compound or a pharmacologically acceptable salt thereof, said compound being represented by the formula



(I)

wherein: R designates a member selected from the group consisting of hydrogen, alkyl groups having 1 to 4 carbon atoms, benzyl group, and phenyl group; and each of R^1, R^2, R^3 and R^4 independently designates a member selected from the group consisting of hydrogen, alkyl groups having 1 to 4 carbon atoms, alkoxyl groups having 1 to 4 carbon atoms, halogens, benzyloxy group, hydroxyl group, alkylthio groups having 1 to 4 carbon atoms, and alkylenedioxy groups having 1 to 4 carbon atoms and formed by the bonding of two of R^1, R^2, R^3 and R^4, or pharmacologically acceptable salts of said compounds; and

a pharmaceutical carrier.

4,128,647

SUBSTITUTED THIAZOLO [3,2-a]-THIOPYRANO[4,3-d]PYRIMIDINES

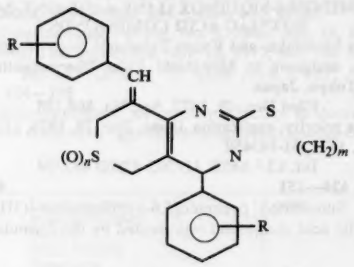
George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 24, 1978, Ser. No. 889,712

Int. Cl.[2] A61K *31/18;* **C07D** *409/14*

U.S. Cl. 424—251 **11 Claims**

1. A compound of the structure



wherein R is hydrogen, lower alkyl, halogen, acyl, cyano, carboxyl, trifluoromethyl, and lower alkoxy, *n* is 0 or 2 and *m* is 2 or 3, and pharmaceutically acceptable salts thereof.

11. A method for treating an inflammatory condition in a mammalian host, which comprises administering to said host a therapeutically effective amount of a compound as defined in claim **1**.

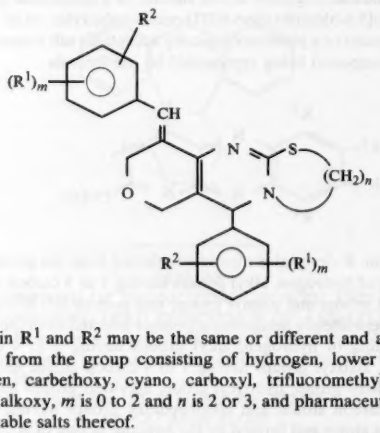
4,128,648

SUBSTITUTED PYRANO[4,3-d]-THIAZOLO[3,2-a]PYRIMIDINES

George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 24, 1978, Ser. No. 889,714
Int. Cl.[2] **A61K** *31/18;* **C07D** *405/14*
U.S. Cl. 424—251 **11 Claims**

1. A compound of the structure



wherein R^1 and R^2 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, halogen, carbethoxy, cyano, carboxyl, trifluoromethyl, and lower alkoxy, *m* is 0 to 2 and *n* is 2 or 3, and pharmaceutically acceptable salts thereof.

11. A method for treating an inflammatory condition in a mammalian host, which comprises administering to said host a therapeutically effective amount of a compound as defined in claim **1**.

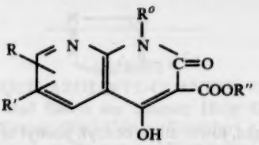
4,128,649

4-HYDROXY-PYRIDO[2,3-B]PYRIDINE-2(1H)-ONE-3-CARBOXYLIC ACIDS AND ESTERS

Goetz E. Hardtmann, Morristown, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

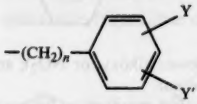
Filed Jun. 29, 1977, Ser. No. 810,949
Int. Cl.[2] **A61K** *31/435;* **C07D** *471/04*
U.S. Cl. 424—256 **37 Claims**

1. A compound having in free acid form the formula:



wherein

R^o is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl portion is of 1 or 2 carbon atoms, or



R'' is hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 3 to 6 carbon atoms or alkynyl of 3 to 6 carbon atoms,

n is 0 or 1,

Y and Y′ are independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms or trifluoromethyl, and

R and R′ are independently hydrogen or alkyl of 1 to 4 carbon atoms, with the proviso that the unsaturation in any alkenyl or alkynyl is other than on the alpha carbon atom; or a mono- or di-salt form thereof in which the salt forming cation is a pharmaceutically acceptable cation.

37. A pharmaceutical composition comprising an inert pharmaceutically acceptable carrier and an amount of a compound of claim **1** effective to symptomatically treat allergic conditions.

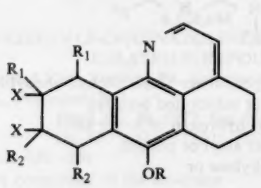
4,128,650

DIBENZO[de, h]QUINOLINE DERIVATIVES

Jean-Louis Fabre, Paris; Daniel Farge, Thiais, and Claude James, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 18, 1977, Ser. No. 798,139
Claims priority, application France, May 21, 1976, 76 15379
Int. Cl.[2] **A61K** *31/47;* **C07D** *215/20*
U.S. Cl. 424—258 **8 Claims**

1. A dibenzo[de,h]quinoline of the formula:



wherein the symbols X each represent hydrogen or methoxy, R represents hydrogen or carboxymethyl, the symbols R_1 each represent hydrogen or together represent a valency bond, the pair of symbols R_2 have the same significance as the pair of symbols R_1, and, when the symbols R_1 and R_2 represent hydrogen the symbols X also represent hydrogen, and, when R is carboxymethyl, a pharmaceutically acceptable salt thereof.

7. A pharmaceutically acceptable alkali metal, alkaline earth metal, ammonium, or amine salt of a dibenzo[de,h]quinoline as claimed in claim **1** wherein R represents carboxymethyl.

8. An anti-viral pharmaceutical composition which comprises a dibenzo[de,h]quinoline as claimed in claim **1**, or, when R is carboxymethyl, a pharmaceutically acceptable salt

thereof, in association with a pharmaceutically acceptable carrier.

4,128,651

BIS-QUATERNARY PYRIDINIUM-2-ALDOXIME SALTS AND A PROCESS FOR THEIR PREPARATION

Ilse Hagedorn, Freiburg, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

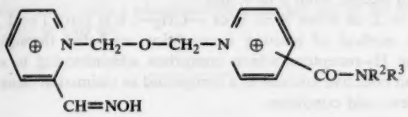
Filed Apr. 11, 1977, Ser. No. 786,693

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616481

Int. Cl.[2] **A61K** *31/44, 31/455;* **C07D** *213/78*

U.S. Cl. 424—263 **17 Claims**

1. A bis-quaternary pyridinium-2-aldoxime salt of the formula



wherein R^2 is H, cyclohexyl, Ar, aralkyl of 7–13 carbon atoms; R^3 is alkyl of 2–6 carbon atoms, cyclohexyl, Ar or aralkyl of 7–13 carbon atoms; Ar is phenyl, naphthyl or phenyl substituted by up to 5 of alkyl of 1–4 carbon atoms, methoxy or Cl; and X is Cl, Br or I.

4,128,652

TRIAZAPENTADIENES AS ACARICIDES

Alexander B. Penrose, Tilmanstone, Nr. Deal, and Michael R. G. Leeming, Canterbury, both of England, assignors to Pfizer Inc., New York, N.Y.

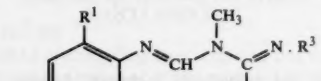
Filed Apr. 13, 1977, Ser. No. 787,084

Claims priority, application United Kingdom, Apr. 20, 1976, 15812/76; Aug. 18, 1976, 34319/76

Int. Cl.[2] **C07D** *213/89;* **A61K** *31/44*

U.S. Cl. 424—263 **17 Claims**

1. A triazapentadiene of the formula:



wherein

R^1 is alkyl of 1 to 4 carbon atoms;

R^2 is selected from the group consisting of hydrogen, chlorine, bromine, fluorine, iodine and alkyl of 1 to 4 carbon atoms;

R^3 is pyridyl optionally containing one or two substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine, bromine, fluorine and iodine.

17. A method of combating ectoparasites on animals which comprises contacting said animals with an acaricidally effective amount of a compound of claim **1**.

4,128,653

REDUCTION OF BLOOD PRESSURE WITH CARBOXYALKYLACYL-PIPECOLIC ACID DERIVATIVES

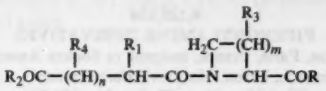
David W. Cushman, West Windsor, and Miguel A. Ondetti, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 657,793, Feb. 13, 1976, Pat. No. 4,052,511. This application Feb. 11, 1977, Ser. No. 768,003

Int. Cl.[2] **A61K** *31/445*

U.S. Cl. 424—267 **16 Claims**

1. A method for reducing blood pressure in hypertensive mammals by inhibiting the conversion of angiotensin I to angiotensin II which comprises administering a composition comprising an amount of a compound of the formula



wherein

R is hydroxy, amino or lower alkoxy;

R_1 and R_4 each is hydrogen, lower alkyl or phenyl-lower alkyl;

R_2 is hydroxy, amino, hydroxyamino or lower alkoxy;

R_3 is hydrogen, hydroxy or lower alkyl;

m is 3;

n is 0, 1 or 2;

and physiologically acceptable salts thereof, effective for inhibiting said conversion, and a pharmaceutically acceptable vehicle therefor.

4,128,654

5-HALOMETHYL-3-PHENYL-2-OXAZOLIDINONES

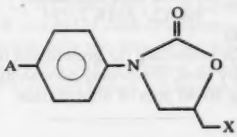
Robert B. Fugitt, Newark, and Raymond W. Luckenbaugh, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 10, 1978, Ser. No. 876,679

Int. Cl.[2] **A61K** *31/42;* **C07D** *263/38*

U.S. Cl. 424—272 **18 Claims**

1. A compound of the formula



wherein

A is 1-methylethyl or $RS(O)_n$—;

X is Cl, Br or F;

R is alkyl of 1–3 carbon atoms; and

n is 0, 1 or 2.

7. A disease control composition consisting essentially of an effective amount of a compound of claim **1** and at least one of a) about 0.01% to 20% by weight surfactant(s) and b) about 5 to 99% by weight solid or liquid diluent(s).

4,128,655

IMIDAZOLINE COMPOUNDS USEFUL AS BACTERICIDES AND FUNGICIDES

Jerry H. Hunsucker, and James R. Selleck, Jr., both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

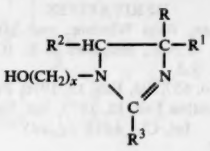
Filed Mar. 11, 1977, Ser. No. 776,801

Int. Cl.[2] **A01N** *9/22*

U.S. Cl. 424—273 R **11 Claims**

1. A method of controlling the growth of bacteria and fungi

by applying to them or to the environment inhabited by them, a growth inhibiting amount of an imidazoline of the formula



where R is hydrogen or methyl, R^1 is hydrogen or alkyl of 1–3 carbon atoms, R^2 is hydrogen or methyl, R^3 is alkyl of 6–10 carbon atoms and x is 1 or 2.

4,128,656

PIPERONYLAMINE DERIVATIVES

Louis Lafon, Paris, France, assignor to Societe Anonyme Dite: Laboratoire L. Lafon, Maisons Alfort, France

Filed Mar. 21, 1977, Ser. No. 779,585

Claims priority, application United Kingdom, Mar. 23, 1976, 11709/76

Int. Cl.² A61K *31/36*

U.S. Cl. 424—282 **2 Claims**

1. A pharmaceutical composition useful in the treatment of aggression comprising an anti-aggression effective amount of N-propargyl-piperonylamine or a non-toxic addition salt thereof in combination with a physiologically acceptable excipient.

2. A method of reducing aggression which comprises administering to a patient an anti-aggression effective amount of N-propargylpiperonylamine or a non-toxic addition salt thereof.

4,128,657

METHOD OF AND FEED FOR FARMING EGG-LAYING HENS USING NIFUROXAZIDE

Germano Cagliero, Ivrea (Turin), Italy, assignor to Marxer S.p.A., Loranze d'Ivrea (Turin), Italy

Filed Apr. 7, 1977, Ser. No. 785,458

Claims priority, application Italy, Apr. 23, 1976, 67989 A/76

The portion of the term of this patent subsequent to Oct. 17, 1995, has been disclaimed.

Int. Cl.² A61K *31/34*

U.S. Cl. 424—285 **4 Claims**

1. A method for promoting the growth and ovideposition of egg-laying poultry hens, comprising nourishing the hens with a feed containing 20–40 ppm of nifuroxazide.

4,128,658

AMINOALKYL FURAN DERIVATIVES

Barry J. Price, Hertford; John W. Clitherow, Sawbridgeworth, and John Bradshaw, Ware, all of England, assignors to Allen & Hanburys Limited, London, England

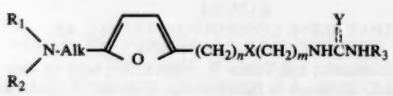
Filed Jul. 25, 1977, Ser. No. 818,762

Claims priority, application United Kingdom, Aug. 4, 1976, 32465/76; Dec. 6, 1976, 50685/76; May 13, 1977, 20187/77

Int. Cl.² A01N *9/12, 9/20*; C07F *307/52, 307/54*

U.S. Cl. 424—285 **45 Claims**

1. A compound of the general formula I:



(I)

or a physiologically acceptable salt, N-oxide or hydrate thereof in which R_1 and R_2 which may be the same or different represent hydrogen, lower alkyl, cycloalkyl, lower alkenyl, aralkyl in which the aryl portion is phenyl or phenyl substituted by alkyl, alkoxy or halo or lower alkyl interrupted by an oxygen atom or a group

in which R_4 represents hydrogen or lower alkyl;

R_3 is hydrogen, lower alkyl, lower alkenyl or alkoxyalkyl;

X is $—CH_2—$, O or S;

Y represents $=S$, $=O$, $=NR_5$ or $=CHR_6$;

Alk denotes a straight or branched alkylene chain of 1 to 6 carbon atoms;

R_5 is H, nitro, cyano, lower alkyl, phenyl, phenyl substituted by alkyl, alkoxy or halo, alkylsulphonyl, or arylsulphonyl in which the aryl portion is phenyl or phenyl substituted by alkyl, alkoxy or halo;

R_6 represents nitro, arylsulphonyl in which the aryl portion is phenyl or phenyl substituted by alkyl, alkoxy or halo or alkylsulphonyl;

m is an integer from 2 to 4; and

n is 1 or 2; or when X = S, or $—CH_2—$, n is zero, 1 or 2.

42. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as claimed in claim 1 to relieve said condition.

4,128,659

ANTIMICROBIAL POLYCYCLIC NITROFURANS

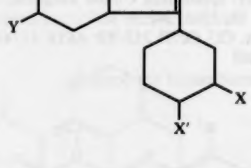
Robert A. Scherrer, White Bear Lake, and Richard M. Stern, Cottage Grove, both of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Filed Dec. 19, 1977, Ser. No. 861,893

Int. Cl.² C07D *307/92, 307/83*; A61K *31/34*

U.S. Cl. 424—285 **3 Claims**

1. A compound of the formula



wherein

X and X′ are individually hydrogen, fluorine, chlorine, bromine or carboxyl,

Y is hydrogen, fluorine, chlorine, bromine, carboxyl, carboxymethyl or, together with Z, can form a propylene chain,

Z and Z′ are individually hydrogen or together can complete a benzo ring,

provided that the compound contains one and only one of the rings including Y and Z, and Z and Z′, and provided further that the compound contains not more than a single carboxyl function, and, when the compound contains a carboxyl function, pharmaceutically acceptable salts thereof.

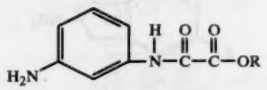
3. A method for arresting or inhibiting the growth of microorganisms comprising contacting microorganisms with a compound according to claim 1 in an amount sufficient to arrest or inhibit the growth of said microorganisms.

4,128,660
ANTI-ALLERGIC AMINOOXANILIC ACIDS AND ESTERS

Charles M. Hall, and John B. Wright, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 19, 1976, Ser. No. 742,437
Int. Cl.[2] A61K *31/24, 31/195*
U.S. Cl. 424—309 25 Claims

1. A pharmaceutical composition which comprises as the sole active agent an anti-asthma, allergic rhinitis, food allergy or urticaria effective amount of a compound of the formula



wherein R is hydrogen, a physiologically acceptable metal or amine cation or alkyl of one to eight carbon atoms, inclusive, or a physiologically acceptable acid addition salt thereof in association with a pharmaceutical carrier and in the form of a tablet or capsule.

4,128,661
(BIS-DIETHYLAMINE)2,5-DIHYDROXYBENZENE-1,4-DISULFONATE, USEFUL AS A MEDICAMENT AGAINST GLAUCOMA

Adrian Schulthess, Vaud, and Alfred de Courten, Geneve, all of Switzerland, assignors to Laboratoyories OM Societe Anonyme, Geneve, Switzerland

Filed Nov. 22, 1977, Ser. No. 853,912
Int. Cl.[2] A61K *31/205*
U.S. Cl. 424—316 3 Claims

1. A method of treating a human being suffering from glaucoma, comprising administering in galenic form to said human a pharmaceutically effective amount of (bis-diethylamine)2,5-dihydroxybenzene-1,4-disulfonate in a pharmaceutically acceptable carrier.

4,128,662
GLYCINE TOXICANTS

Myron J. Lover, Mountainside; Arnold J. Singer, South Orange; Donald M. Lynch, Waldwick, and William E. Rhodes, III, Roselle, all of N.J., assignors to Block Drug Company, Inc., Kenilworth, N.J.

Filed Apr. 28, 1977, Ser. No. 791,780
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—319 6 Claims

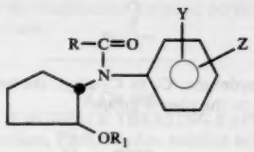
1. A method of controlling insects or their ova which comprises applying to a human or animal in need of such control an effective toxic amount of at least one N-C_{12-24} aliphatic acyl-N-methyl glycine.

4,128,663
ANILIDE DERIVATIVES AS ANTIDEPRESSANTS

Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 777,599, Mar. 15, 1977, which is a continuation-in-part of Ser. No. 746,191, Nov. 30, 1976, abandoned. This application May 16, 1977, Ser. No. 796,989
Int. Cl.[2] A61K *31/165, 31/195, 31/655;* C07C *103/10*
U.S. Cl. 424—324 17 Claims

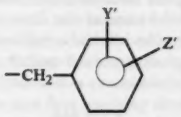
1. A compound of the formula



wherein the heavy dot (•) at the 1-position carbon atom of the cyclopentyl ring denotes the trans-configuration relative to the oxygen group (—OR_1) in the 2-position of the cyclopentyl ring;

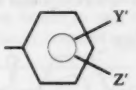
R is hydrogen, C_1 to C_3-alkyl, or C_2 to C_4-alkenyl,;

R_1 is hydrogen, C_1 to C_3-alkyl, C_3 to C_5-(allylic)alkenyl, the benzyl group



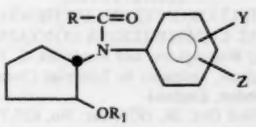
wherein Y′ and Z′ are as defined below, or R_1 is the group

where R_2 is hydrogen, C_1 to C_3-alkyl, the benzyl group as above, or a phenyl group



wherein Y′ and Z′ are as as defined hereinbelow; and each of Y and Z or Y′ and Z′ is selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_1 to C_3-alkyl and C_1 to C_3-alkyloxy wherein Y, Z, or Y′ and Z′ can be the same or different, and Y, Z, or Y′ and Z′ are not necessarily the same at the same time.

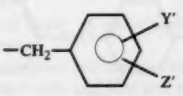
11. A process for treating depression which comprises administering to a depressed human a compound of the formula



wherein the heavy dot (•) at the 1-position of thecyclopentyl ring denotes the trans configuration relative to the oxygen group (OR_1) in the 2-position of the cyclopentyl ring;

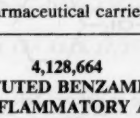
R is hydrogen, C_1 to C_3-alkyl, or C_2 to C_4-alkenyl;

R_2 is hydrogen, C_1 to C_3-alkyl, C_3 to C_5-(allylic)alkenyl, the benzyl group,



wherein Y′ and Z′ are as defined below, or R_1 is the group

where R_2 is hydrogen, C_1 to C_3-alkyl, the benzyl group as defined above or the phenyl group



wherein Y' and Z' are as defined below, and each of Y, Z, Y' and Z' is selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_1 to C_3-alkyl and C_1 to C_3-alkyloxy, and wherein Y, Z, Y' and Z' can be the same or different, and Y, Z, Y' and Z' are not necessarily the same at the same time, in a non-toxic amount effective to alleviate the conditions of depression, in association with a pharmaceutical carrier.

4,128,664

SUBSTITUTED BENZAMIDES AS ANTI-INFLAMMATORY AGENTS

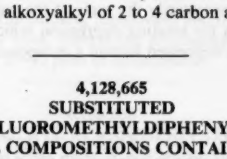
George G. I. Moore, Birchwood, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 797,175, May 16, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,620

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—324 **8 Claims**

1. A method for combatting inflammatory processes in a mammal which comprises administering an effective dose less than the toxic amount of a compound of the formula



wherein R^1 is hydrogen, alkyl of 1 to 4 carbon atoms or alkoxyalkyl of 2 to 4 carbon atoms or allyl, and R^2 is alkyl of 1 to 4 carbon atoms or alkoxyalkyl of 2 to 4 carbon atoms or allyl to said mammal.

4,128,665

SUBSTITUTED DINITROTRIFLUOROMETHYLDIPHENYLAMINE AND PESTICIDAL COMPOSITIONS CONTAINING SAME

John D. Hunt, Wokingham, and Frederick C. Peacock, Ascot, both of England, assignors to Imperial Chemical Industries Limited, London, England

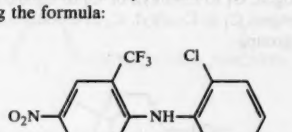
Filed Oct. 28, 1975, Ser. No. 627,771

Claims priority, application United Kingdom, Nov. 6, 1974, 47977/74

Int. Cl.[2] C07C *87/54;* A01N *9/20*

U.S. Cl. 424—330 **6 Claims**

1. 2,5'-Bistrifluoromethyl-2'-chloro-4,6-dinitrodiphenylamine having the formula:



4,128,666

4 AND 5-HALO SUBSTITUTED 2-INDANAMINE COMPOUNDS

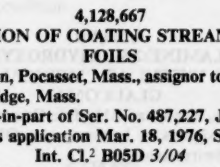
William E. Bondinell, Cherry Hill, N.J., and Robert G. Pendleton, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 18, 1977, Ser. No. 825,623

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—330 **6 Claims**

1. A compound of the formula:



in which:

R_1 and R_2 are chloro, bromo, fluoro, iodo or trifluoromethyl, R_1 and R_2 being the same or different or a pharmaceutically acceptable acid addition salt thereof.

4,128,667

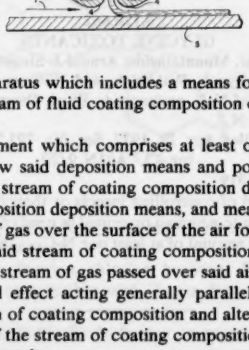
MANIPULATION OF COATING STREAMS WITH AIR FOILS

William J. Timson, Pocasset, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 487,227, Jan. 10, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,210

Int. Cl.[2] B05D *3/04*

U.S. Cl. 427—348 **6 Claims**



1. In an apparatus which includes a means for dispensing a free falling stream of fluid coating composition onto a moving web;

the improvement which comprises at least one air foil located below said deposition means and positioned to be adjacent a stream of coating composition dispensed from said composition deposition means, and means for passing a stream of gas over the surface of the air foil immediately adjacent said stream of coating composition;

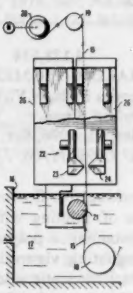
whereby the stream of gas passed over said air foil provides a frictional effect acting generally parallel to and upon said stream of coating composition and alters the free fall velocity of the stream of coating composition as it moves toward the web.

4. A method for altering the free fall velocity of a free falling fluid coating composition stream dispersed from a coating applicator prior to reaching a moving web, said method comprising directing a stream of gas over at least one air foil having a surface situated immediately adjacent said stream of coating composition whereby a frictional effect acting generally parallel to and upon said stream of coating composition alters the free fall velocity of said stream of coating composition as it moves toward said web.

4,128,668
METHOD OF REMOVING EXCESS LIQUID COATING FROM WEB EDGES IN LIQUID COATING THICKNESS CONTROL

Robert T. Ernest, Valparaiso, Ind., assignor to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 685,801, May 12, 1976, which is a continuation of Ser. No. 540,599, Jan. 13, 1975, abandoned. This application Oct. 29, 1976, Ser. No. 737,024
Int. Cl.[2] B05D *3/04*
U.S. Cl. 427—349 2 Claims



1. A method of removing excess liquid coating from both surfaces of a moving, continuous imperforate web issuing from a bath of liquid coating of the type that will harden to form a solid coating on a substrate while preventing objectionable residual heavier liquid coating from remaining on the longitudinal marginal portions of the surfaces of the web comprising

providing fluid under pressure,

forming a pair of opposed streams of fluid under pressure arranged respectively on each of the opposite surfaces of the moving web,

forming each stream of the pair of opposed streams of fluid under pressure in a nozzle having an elongated plenum chamber and a fluid emitting orifice forming means having an opening facing toward the associated surface of the web and extending across the width of the associated surface of the web for connecting the plenum chamber with the exterior of the nozzle so as to form a continuous steam extending across the width of the associated surface of the moving web at least from one longitudinal edge to the other longitudinal edge of the web,

impinging the opposed streams of fluid under pressure respectively against the associated opposite surfaces of the moving web to remove excess liquid coating from the opposite surfaces of the web,

determining the direction of movement of the fluid under pressure in each stream by shaping each stream of fluid under pressure in the nozzle,

the direction of movement of the fluid under pressure in each stream being determined at least in part by admitting fluid under pressure into the intermediate portion only of the elongated plenum to cause the fluid under pressure in each end portion of the plenum chamber to have a component of motion parallel to the length dimension of the plenum chamber and a component of motion normal to the associated surface of the web to thereby impart to the fluid under pressure issuing from the fluid emitting orifice forming means and impinging on the two marginal portions of the associated surface of the web movement in respect to each marginal portion having a component normal to the surface of the marginal portion of the web and a component parallel to the surface of the marginal portion of the web and in a direction toward the associated longitudinal edge of the web to cause movement of excess liquid coating on the surface of each of the two marginal portions of the web downwardly and outwardly toward the respective longitudinal edges of the web to thereby eliminate objectionable residual heavier liquid coating on the longitudinal marginal portions of the surfaces of the web.

4,128,669
METHOD OF SURFACE TREATING PAPER WEBS

Bengt A. Wennerblom, Piteå, Sweden, assignor to SCA Development Aktiebolag, Sundsvall, Sweden

Filed Aug. 2, 1977, Ser. No. 821,231
Claims priority, application Sweden, Aug. 27, 1976, 7609524
Int. Cl.[2] B05D *1/26, 1/34*
U.S. Cl. 427—8 2 Claims

1. A method of controlling the amount of active substance applied to the surface of a continuously-moving paper web, said active substance being dissolved in or dispersed in a treating liquid, said paper web being passed over a coating unit in the form of a container, said container being positioned transverse to the direction of movement of said paper web and having an opening through which the treating liquid is applied to the paper web, including the steps of:

supplying a first fluid with a predetermined amount of said active substance to a first batching device,

supplying a second fluid consisting of pure solvent or dispersing agent to a second batching device,

controlling the output of said first batching device in response to the speed of said paper web to control the amount of active substance supplied to a mixer,

controlling the output of said second batching device in response to the fluid pressure at said opening to control the amount of solvent or dispersing agent supplied to said mixer,

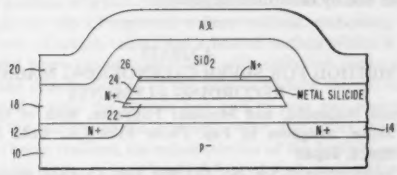
mixing the outputs of said first and second batching devices at said mixer to form said treating liquid, and

supplying said treating liquid to said openings so that said paper web is completely covered with said treating liquid.

4,128,670
FABRICATION METHOD FOR INTEGRATED CIRCUITS WITH POLYSILICON LINES HAVING LOW SHEET RESISTANCE

Fritz H. Gaensslen, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1977, Ser. No. 850,586
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—86 12 Claims



1. A method for fabricating an electrically conductive combined polysilicon and metal silicide structure for integrated circuits comprising the steps of depositing a first layer of polysilicon on a substrate,

depositing a layer of silicide forming metal on said first polysilicon layer,

depositing a second layer of polysilicon on said silicide forming metal layer,

and heating said polysilicon and metal structure to cause said metal layer to react with said first and second polysilicon layers to form a metal silicide layer intermediate said first and second polysilicon layers.

4,128,671

INSTANT SILVERING SOLUTION

Robert Suggs, Barrington, Ill., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Mar. 14, 1973, Ser. No. 341,262
Int. Cl.[2] B05D *5/12*; C23C *3/00*
U.S. Cl. 427—125 2 Claims

1. A silverplating bath in clear liquid solution form which may be applied to the surface of copper or copper-based substrates to instantaneously deposit a fine layer of silver on the surface thereof without need of applied electric current, said silverplating bath consisting of an aqueous solution in which has been combined two parts by way of sodium cyanide and 1 part of silver nitrate by weight, and the water content of the bath comprises 128 parts by weight.

4,128,672

PROCESS OF MAKING A MAGNETIC RECORDING MEDIUM

Gerd Wunsch, Speyer; Paul Deigner, Weisenheim; Roland Falk, Achern; Karl Mahler, Kehl; Werner Loeser, Ludwigshafen; Friedrich Domas, Altlussheim; Peter Felleisen, Lampertheim, and Werner Steck, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 24, 1975, Ser. No. 625,659
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1974, 2451276
Int. Cl.[2] H01F *10/00*
U.S. Cl. 427—130 5 Claims

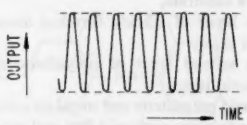
1. In a process for the manufacture of rigid magnetic recording media in which a thin film of a cobalt-containing ferromagnetic metal having a coercivity of from 23 to 75k A/m is deposited by electroless deposition on an activated rigid base followed by the application of a less than 0.1 μ thick protective layer to the surface of the said thin film of cobalt-containing ferromagnetic metal and said rigid base includes a non-magnetic metallic base disc at least one surface of which carry a layer (S) from 2 to 100 μm thick, which layer (S) has been brought by machining to a peak-to-valley height R_t of not more than 0.3 μ, is insoluble in, and virtually non-swellable by, organic solvents and consists of a dispersion of from 0.5 to 5 parts by weight of a finely divided non-magnetic pigment (P) of a Mohs' hardness of at least 6, per part by weight of a cured binder (B) which firmly bonds the pigments to the base disc, the improvement which comprises: activating the surface of the base disc by treatment with a solution of a palladium(O) complex in an organic solvent and decomposing the complex, and thereafter depositing a thin film of ferromagnetic metal of about 0.05 to 1 μ thickness on the so-activated surface of the base disc by electroless deposition.

4,128,673

METHOD FOR SUPER CALENDERING MAGNETIC RECORDING ELEMENTS

Kenzi Watanabe, and Masaaki Fujiyama, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 657,800, Feb. 13, 1976, abandoned.
This application Jul. 25, 1977, Ser. No. 818,706
Claims priority, application Japan, Feb. 13, 1975, 50-18213; Mar. 7, 1975, 50-27783
Int. Cl.[2] H01F *10/02*
U.S. Cl. 427—130 7 Claims



1. In a method for super calendering a magnetic recording element comprising a non-magnetic flexible support having provided thereon a magnetic layer mainly composed of ferromagnetic powders and a binder using a super calendering roll assembly having a metal roll in contact with the magnetic layer side and having an elastic roll on the support side opposite said metal roll which comprises pressing the surface of said magnetic layer to thereby super calender the same, the improvement wherein at least the surface area of said elastic roll comprises a polyamide resin having a Shore hardness D of 80 to 95, a linear expansion coefficient of at least 8×10^{-5}/° C. a compressive strength of at least about 700, and a molecular weight of 10,000 to 1,000,000.

4,128,674

METHOD OF MAKING PIGMENTED PHOSPHORS

Robert A. Hedler, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 31, 1976, Ser. No. 672,112
Int. Cl.[2] C09K *11/08, 11/20, 11/42*
U.S. Cl. 427—218 8 Claims

1. A method of making free-flowing, pigmented phosphors comprising the steps of: diluting with water a 20% pigment stock suspension containing a polyacrylamide; adding phosphor particles and agitating vigorously; adjusting the pH to about 5.0 by adding a 10% acetic acid solution; adding a small amount of a positively charged colloidal silica with constant stirring; adding a base to raise the pH to about 9; stirring for a suitable time to allow said silica and said pigment to co-precipitate upon said phosphor particles; and removing the remaining liquid and drying said phosphor particles; and removing the remaining liquid and drying said phosphor particles.

4,128,675

PROCESS FOR TREATING TEXTILES WITH REACTIVE POLYMERS

Erich Rössler, Leitershofen; Hans Deiner, Neussass; Bernhard Sandner, Diedorf, and Hans Schilling, Langweid, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,162
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616797
Int. Cl.[2] B05D *3/02*
U.S. Cl. 427—390 E 17 Claims

1. A process for making textiles water-proof and water-repellent, comprising the steps of

(a) applying to a textile an aqueous composition comprising a reactive copolymer which is stable to hydrolysis in the aqueous medium, which is a copolymer of ethylenically unsaturated monomers which include 1.5 to 20%, by weight of the copolymer, of a monomer which contains a carboxylic acid amide methylol group or a C_1–C_3 alkyl ether thereof or a mixture thereof; 0.5 to 15%, by weight of the copolymer, of an aminosilane or an aminosiloxane or a mixture thereof; and 0.5 to 15%, by weight of copolymer, of an organometallic catalyst; and

(b) heating the treated textile to harden the copolymer thereon.

4,128,676

METHOD OF HOT-DIP COATING A FERROUS SUBSTRATE WITH A ZINC-ALUMINUM ALLOY RESISTANT TO INTERGRANULAR CORROSION

Harvie H. Lee, Glenwood, Ill., assignor to Inland Steel Company, Chicago, Ill.

Division of Ser. No. 646,530, Jan. 5, 1976, Pat. No. 4,029,478.
This application Apr. 18, 1977, Ser. No. 788,109
Int. Cl.[2] C23C *1/02*
U.S. Cl. 427—433 4 Claims

1. A method of providing a zinc-aluminum alloy coated ferrous metal sheet having a zinc-aluminum alloy hot-dip coating which has improved resistance to intergranular corrosion

comprising the step of continuously immersing a ferrous metal sheet in a hot-dip coating bath which consists essentially of between about 0.2 wt. % and about 17 wt. % aluminum, between about 0.06 wt. % and about 0.15 wt. % lead, and about 0.1 wt. % magnesium with the balance being essentially zinc.

4,128,677

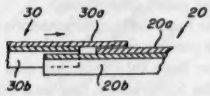
MULTI-FLUTE-LAYER CORRUGATED BOARD

Walther J. Hoelzinger, Vienna, Austria, assignor to Boise Cascade Corporation, Boise, Id.

Division of Ser. No. 722,699, Sep. 13, 1976. This application Mar. 23, 1978, Ser. No. 889,387

Int. Cl.[2] B31F *1/22*; B32B *3/28*

U.S. Cl. 428—57 **4 Claims**



1. A continuous horizontal web of corrugated paperboard of indefinite length formed from a plurality of successive sections each including an upper first planar facer layer, and a lower first corrugated layer bonded in superimposed generally coextensive relation to said planar layer, the layers of each section having generally the same outer cross-sectional dimensions and being longitudinally offset to cause the facer layer to protrude at one end beyond the corrugated layer, and the corrugated layer to protrude at the other end beyond the facer layer, the flutes of the corrugated layer extending longitudinally beween the protruding ends of each section, the protruding portion of the facing layer of each section being bonded in overlapping relation to the protruding portion of the corrugated layer of the adjacent preceding section and to the adjacent portion of the facing layer of said preceding section, the protruding portion of the corrugated layer of each section being bonded in underlying flute-enmeshing relation with the corrugated layer of the adjacent trailing section, thereby to define a continuous web the flutes of which extend longitudinally.

4,128,678

HEAT INSULATING MATERIAL AND METHOD OF AND APPARATUS FOR THE MANUFACTURE THEREOF

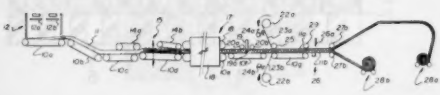
Paul E. Metcalfe; Randall W. Rollo, and Malcolm J. Stagg, all of Sarnia, Canada, assignors to Fiberglas Canada Limited, Toronto, Canada

Filed Jul. 7, 1977, Ser. No. 813,674

Claims priority, application Canada, Apr. 12, 1977, 275977

Int. Cl.[2] C04B *43/02*

U.S. Cl. 428—119 **11 Claims**



1. Apparatus for manufacturing a heat insulating material from an uncured, longitudinally advancing strip-shaped felt of fibres containing a heat hardenable bonding substance, the apparatus comprising:

means for forming in the uncured felt corrugations extending across the entire width of the felt and following one another in succession along the length of the felt;

means for compressing the corrugated felt in the direction of advance of the felt to press the successive corrugations of the felt against one another;

a felt curing section for applying heat to the corrugated felt to form a cured felt containing fibres extending in a serpentine array along the felt between opposite flat sides of the felt with the successive corrugations of the felt bonded to one another;

means for providing a pair of backing sheets secured to outermost portions of the corrugations along the opposite major surfaces of the corrugated felt;

means for longitudinally cutting the cured felt between and parallel to the backing sheets to separate the cured felt into two partial felts; and

means for longitudinally conveying the felt along a path of travel extending past the cutting means;

the cutting means comprising a cutting blade extending transversely across said path of travel, whereby the corrugations are severed so that the fibres form U-shaped arrays disposed in succession along each of the partial felts.

4,128,679

SOFT, NON-WOVEN FABRICS AND PROCESS FOR THEIR MANUFACTURE

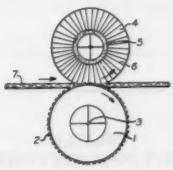
Alois Pohland, Weinheim, Germany, assignor to Firma Carl Freudenberg, Weinheim, Germany

Continuation of Ser. No. 306,126, Nov. 13, 1972, abandoned. This application Oct. 21, 1974, Ser. No. 516,837

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1971, 2156961

Int. Cl.[2] B32B *3/10, 31/00*

U.S. Cl. 428—131 **23 Claims**



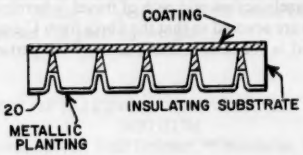
1. A process for preparing a soft, non-woven fabric which comprises passing a mat of non-woven fibers free of binder, at least a portion of which fibers comprises thermoplastic fibers, through the nip of opposed rollers without embossing the same, one of which rollers has a heated surface which is uneven and bears against said fabric with sufficient pressure to cause the raised portions of the uneven surface thereof to be depressed within the fibrous mat and to pass and penetrate within the surface of the opposed roller, the roller opposed thereto being resilient, the raised portion of the heated uneven surface having heated teeth which heated teeth pass within the interior of said non-woven fabric while the fabric is maintained free of regions of non-uniform compression whereby to form holes therein and welding of the fibers of said fabric together at the margin of said holes, said fibers being selected from the group consisting of nylon fibers, styrene fibers, styrene copolymer fibers, acrylic fibers, cellulosic fibers, polyolefin fibers and polyvinyl chloride fibers.

21. A soft, non-woven fabric free of binding agents and composed, at least in part, of thermoplastic fibers selected from the group consisting of nylon fibers, styrene copolymer fibers, acrylic fibers, cellulose fibers, polyolefin fibers and polyvinylchloride fibers, such fibers bonded to other fibers at their crossing points, said fabric having a smooth surface, said fabric being produced by the process of claim 1.

4,128,680
SILICON COATED CERAMIC SUBSTRATE WITH IMPROVEMENTS FOR MAKING ELECTRICAL CONTACT TO THE INTERFACE SURFACE OF THE SILICON

Joseph D. Heaps, Minnetonka, and Obert N. Tufte, Prior Lake, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 3, 1977, Ser. No. 803,010
Int. Cl.[2] B32B *3/10, 9/04, 13/04;* B05D *5/12*
U.S. Cl. 428—137 6 Claims

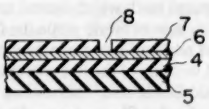


1. A crystalline silicon coated ceramic substrate providing electrical contacts to the interface surface of the silicon coating from the substrate side comprising:
- a ceramic substrate having narrow openings through the thickness of said substrate from front face to back face thereof;
- a layer of crystalline silicon grown onto the front face of said ceramic substrate and through said openings by contacting said front face with molten silicon to form said silicon layer, said silicon layer while still molten also wicking through said narrow openings from said layer on said front face towards said back face to thereby provide electrical contacts to the interface surface of the silicon layer from the substrate side.

4,128,681
METHOD FOR PRODUCING AN InSb THIN FILM ELEMENT

Nobuo Kotera, Kokubunji, and Nobuo Miyamoto, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 26, 1976, Ser. No. 735,139
Claims priority, application Japan, Oct. 24, 1975, 50-127403
Int. Cl.[2] B32B *15/20*
U.S. Cl. 428—138 36 Claims



1. An InSb thin film element comprising a substrate at least one surface of which is made of alumina or an inorganic insulating material containing at least 12 mol % of alumina, an InSb thin film which is provided on the surface of said substrate, which has a thickness of at most 0.2 μm and which has been molten and recrystallized, and a film which is provided on said InSb thin film and which is made of alumina or an inorganic insulating material containing at least 12 mol % of alumina.

4,128,682
AUTO CEILING PANEL AND ITS MANUFACTURING METHOD

Takao Nomura; Yoshiro Umemoto, both of Nagoya, and Tatsuo Sakamoto, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 30, 1978, Ser. No. 891,643
Int. Cl.[2] B62D *25/06;* B32B *3/10, 3/26*
U.S. Cl. 428—138 10 Claims

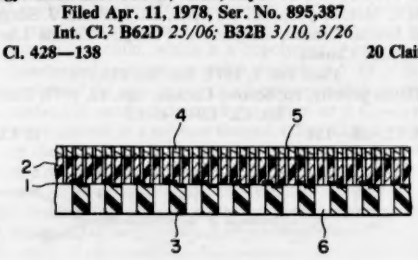
1. Auto ceiling panel comprising:
- a polyethylene foam on the auto interior side which has been bored with numerous small holes;
- a polyethylene foam on the ceiling side to be pasted to said polyethylene foam which has been bored with numerous large holes;
- and a metal lath sandwiched between said auto interior side polyethylene foam and said ceiling side polyethylene foam.

5. Auto ceiling panel of claim 1, wherein a permeable leather is attached to the interior side surface of said interior side polyethylene foam.

4,128,683
AUTO CEILING PANEL AND ITS MANUFACTURING PROCESS

Takao Nomura; Yoshiro Umemoto, both of Nagoya, and Tatsuo Sakamoto, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 11, 1978, Ser. No. 895,387
Int. Cl.[2] B62D *25/06;* B32B *3/10, 3/26*
U.S. Cl. 428—138 20 Claims



1. Auto ceiling panel comprising:
- an interior side polyethylene foam;
- a vinyl chloride sheet bonded to the internal surface of said interior side polyethylene foam;
- a large number of fine holes running through both said interior side polyethylene foam and said vinyl chloride sheet;
- a ceiling side polyethylene foam thermally fused through a metal lath to the ceiling side surface of said interior side polyethylene foam;
- and a large number of less fine holes bored on said ceiling side polyethylene foam.

4,128,684

METHOD OF PRODUCING A PACKING AND A PACKING LAYER MADE THEREBY

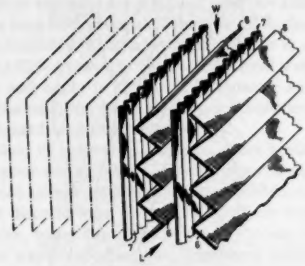
Pietro Bomio, Winterthur, and Werner Meier, Elgg, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 593,381, Jul. 7, 1975, abandoned. This application Nov. 5, 1976, Ser. No. 739,047

Claims priority, application Switzerland, Jul. 9, 1974, 9404/74

Int. Cl.[2] B32B *1/00*

U.S. Cl. 428—175 11 Claims



1. A packing comprising a plurality of shaped layers of a textile sheet-structure, at least some of said layers defining flow ducts and at least some of said layers being formed of thin non-metallic multifilament yarns and thicker monofilament plastic yarns with at least some of said thicker plastic yarns being permanently deformed to impart a self-supported shape to said layers, each of said flow ducts of said deformed layers having a constant dimension throughout.

4,128,685

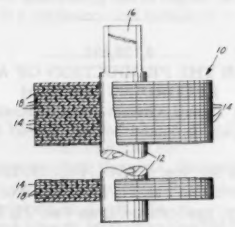
SKIVABLE BILLET AND PRODUCTS

Robert D. Lowrey, North Oaks; Arthur A. Wegwerth, Maplewood; Donna M. Koeck, Saint Paul, and Sanford Cobb, Jr., Saint Mary's Point, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 6, 1976, Ser. No. 747,506

Int. Cl.[2] B32B *9/00, 23/08, 27/30*

U.S. Cl. 428—212 3 Claims



1. A skivable billet of alternating layers of low and relatively high optical density, said layers being relatively similar in absorptive properties toward infrared radiation, said layers of low optical density being essentially cellulose acetate butyrate and said layers of relatively higher optical density being a composition comprised of composite self-cross-linking anionic acrylates, finely divided silica and water soluble polyazo direct dye.

4,128,686

MANAGEMENT OF INCONTINENCE

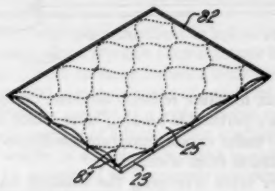
William Kyle, 206, Templestowe Rd., Lower Templestowe, Victoria, and Bruce H. Lee, 9, Wimbourne Rd., Mount Waverley, Victoria, both of Australia

Filed Jan. 14, 1977, Ser. No. 759,549

Claims priority, application Australia, Feb. 3, 1976, PC4702; Feb. 12, 1976, PC4831; Apr. 1, 1976, PC5435

Int. Cl.[2] B32B *5/02;* A61F *13/16;* B32B *5/06*

U.S. Cl. 428—219 19 Claims



1. In an assembly for the management of incontinence comprising at least one layer of non-absorbent hydrophobic textile material through which urine can freely pass and at least one layer of absorbent hydrophilic textile material behind the said at least one non-absorbent layer to receive and absorb urine passing through the said at least one non-absorbent layer,

the improvement comprised in that the abosrbent layer is formed of aligned cellulosic staple fibers of at least 0.5 inch length and denier in the range 2 to 7 formed into a cross-laid web and needled at 1500 to 2000 punchings per square inch to form a felt which will absorb at least 350% by weight of urine based upon its dry weight and will disperse urine laterally by capillarity throughout the felt.

4,128,687

PROCESS FOR FIREPROOFING POLYESTER FIBER MATERIALS WITH SUBSTITUTED SULPHURYLAMIDES

Hermann Nachbur, Dornach; Armin Hiestand, Binningen, and Peter Rohringer, Schönenbuch, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

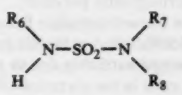
Filed Jun. 20, 1977, Ser. No. 808,006

Claims priority, application Switzerland, Jun. 25, 1976, 8153/76

Int. Cl.[2] B32B *27/36;* B05D *3/02;* C09D *5/18;* C09K *3/28*

U.S. Cl. 428—253 11 Claims

1. A process for fireproofing fiber materials consisting essentially of polyester, which process comprises treating these materials with a preparation containing a flameproofing agent consisting essentially of at least one substituted sulphurylamide which corresponds to the formula



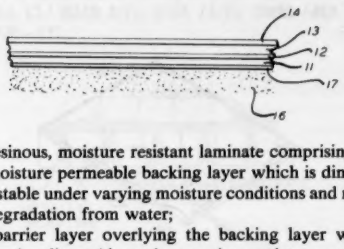
wherein

R_6 is phenyl, naphthyl, phenylethyl, benzyl, cyclohexyl or hydrogen; and R_7 and R_8 each have the meanings given for R_6, with at most two of the radicals R_6, R_7 and R_8 being hydrogen and subjecting the materials treated in this manner to a heat treatment.

4,128,688
RESINOUS MOISTURE RESISTANT LAMINATE

John W. Wiley, Woodstown, N.J., assignor to Mannington Mills, Inc., Salem, N.J.

Filed Dec. 14, 1976, Ser. No. 750,570
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—311 11 Claims

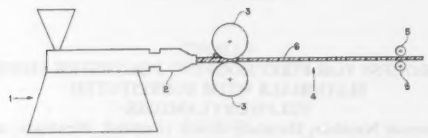


1. A resinous, moisture resistant laminate comprising:
(a) a moisture permeable backing layer which is dimensionally stable under varying moisture conditions and resistant to degradation from water;
(b) a barrier layer overlying the backing layer which is dimensionally stable under varying moisture conditions and substantially impervious to moisture penetration;
(c) an intermediate, open-cellular, foamed resinous layer overlying the barrier layer; and
(d) a resinous wear layer overlying the intermediate layer.

4,128,689
THERMOPLASTIC POLYMER SHEETS OR WEB MATERIAL USEFUL AS SURFACING MATERIALS AND THEIR MANUFACTURE

John M. Heaps, Bourne End, and Chisen Lu, Hounslow, both of England, assignors to Formica International Limited, London, England

Filed Apr. 26, 1977, Ser. No. 790,990
Claims priority, application United Kingdom, Apr. 27, 1976, 17005/76
Int. Cl.[2] B29D *27/00*
U.S. Cl. 428—311 14 Claims



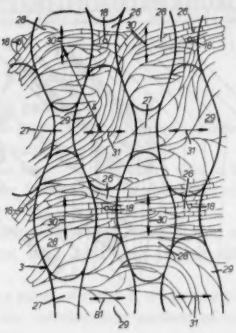
1. A process for preparing thermoplastic sheets or webs, which process comprises the steps of:
(i) extruding a foamable thermoplastic polymer mixture through the die of a screw extruder to produce a foamed extrudate in sheet or web form, the foamable thermoplastic polymer mixture containing at least a first and a second thermoplastic polymer, the first thermoplastic polymer being substantially crystalline and having a higher melting point than, and being substantially immiscible with, the second thermoplastic polymer, and the temperature of extrusion being equal to or greater than the melting point of the first thermoplastic polymer;
(ii) stretching the foamed extrudate from step (i) in the direction of extrusion as it leaves the die to rupture most of the cells of the foamed extrudate and to elongate the walls of the collapsed cells in the direction of stretch;
(iii) compressing the stretched extrudate from step (ii) while it remains plastic; and
(iv) cooling and foamed, stretched and compressed extrudate from step (iii).

13. The thermoplastic sheet or web having an integral patterning and fibrous structure prepared in accordance with the process of claim 1.

4,128,690
TOUGHENED GLASS SHEETS

James Boardman, Kings Norton, and Peter M. Ash, Studley, both of England, assignors to Triplex Safety Glass Company Limited, Kings Norton, England

Filed Mar. 1, 1977, Ser. No. 773,165
Claims priority, application United Kingdom, Mar. 5, 1976, 8995/76
Int. Cl.[2] C08B *27/00*
U.S. Cl. 428—332 4 Claims



1. A glass sheet for use as a side or rear window for a motor vehicle and of thickness in the range 2.5 mm to 3.5 mm which sheet is differentially quenched to produce in the glass sheet a distribution of regions of more highly toughened glass interspersed with regions of lesser toughened glass, the average central tensile stress in the glass sheet being in the range of from a maximum of 62 MN/m^2 for all glass thicknesses from 2.5 to 3.5 mm to a minimum of 56.5 MN/m^2 for 2.5 mm thick glass varying inversely with thickness down to a minimum of 53 MN/m^2 for 3.5 mm thick glass, and there being a distribution of medium toughened glass areas interspersed among said more highly toughened and said lesser toughened regions in the glass sheet and in which there are major and minor principal stresses acting in the plane of the glass sheet, the difference between said major and minor principal stresses in at least some of said medium toughened areas being at a maximum in the range 8 MN/m^2 to 25 MN/m^2, the major principal stresses in adjacent ones of such medium toughened areas being in substantially different directions, and the distance between the centres of such adjacent areas being in the range 15 mm to 30 mm, the number and location of such adjacent areas being sufficient that upon fracture there is an absence of splines of more than 6 cm in length in the glass sheet.

4,128,691
PROCESS FOR THE PRODUCTION OF A MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Tatsuji Kitamoto, and Masaaki Suzuki, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 550,906, Feb. 19, 1975, abandoned.
This application Jul. 27, 1976, Ser. No. 709,103
Claims priority, application Japan, Feb. 21, 1974, 49-19897
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—336 8 Claims

1. A process for the production of a magnetic recording medium by electroless plating onto a substrate, which comprises carrying out the electroless plating in a plating aqueous solution containing 0.02 to 0.6 mol/l of cobalt ion, 0 to 0.02 mol/l of nickel ion, 0.0002 to 0.005 mol/l of barium ion, 0.03 to 0.4 mol/l of hypophosphite ion and a complexing agent at a temperature of 60° C.–95° C. and wherein the pH of the aqueous solution ranges from 6.5 to 9.0.

4,128,692

SUPERABSORBENT CELLULOSIC FIBERS HAVING A COATING OF A WATER INSOLUBLE, WATER ABSORBENT POLYMER AND METHOD OF MAKING THE SAME

Albert R. Reid, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 501,112, Aug. 27, 1974, abandoned. This application May 25, 1977, Ser. No. 800,248

Int. Cl.[2] D06M *1/00*

U.S. Cl. 428—378 17 Claims

1. Cellulosic fibers having a rapid rate of absorption and a high absorption capacity for water or aqueous salt solutions comprising a long fiber cellulose having on its surfaces a coating of water-insoluble, water-absorbent polymer in an amount equal to 15 to 90% by weight based on the total weight of the coated fiber and being in the form of separate and discrete fibers, said coated fibers having a higher absorption capacity than the uncoated long fiber cellulose.

11. A method of preparing cellulosic fibers having a rapid rate of absorption and a high capacity for water or aqueous salt solutions which comprises preparing an aqueous suspension of separate and discrete long fiber cellulose fibers containing a water-insoluble, water-absorbent polymer, stirring the suspension until the water-insoluble, water-absorbent polymer forms an aqueous gel, adding to the suspension an inert water-miscible diluent in which the polymer is neither soluble nor swellable to precipitate the polymer onto the surface of the long fiber cellulose and thereafter dehydrating the coated fibers by contacting them with a water-miscible diluent in which the polymer is neither soluble nor swellable, removing the diluent and recovering separate and discrete long fiber cellulose fibers therefrom.

4,128,693

WIRE COATED WITH FLUOROCARBON BLEND

Kewal S. Dhami, Shrewsbury; Elmer W. Bennett, Westboro, and Pearl Burton, Leominster, all of Mass., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 615,835, Sep. 9, 1975, abandoned. This application May 5, 1977, Ser. No. 794,313

Int. Cl.[2] B32B *15/00, 27/00*

U.S. Cl. 428—379 3 Claims

1. Wire coated with an extruded coating composition comprising a blend of

(a) from 55 to 95% by weight of a tetrafluoroethylene polymer and

(b) from 5 to 45% by weight of a copolymer of tetrafluoroethylene and an ether of the formula $CF_2{=}CF{-}O{-}R$ wherein R is a perfluoroalkyl radical of 1–5 carbon atoms.

4,128,694

LAMINATES COMPRISING A PLASTICIZED INTERLAYER

David A. Fabel, Springfield; James A. Snelgrove, Monson, and Robert H. Fariss, Northampton, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed May 9, 1977, Ser. No. 794,776

Int. Cl.[2] B32B *27/36*

U.S. Cl. 428—412 8 Claims

1. A laminate comprising at least one sheet of thermoplastic resin selected from the group consisting of polycarbonates and polyacrylates laminated to a sheet of polyvinyl butyral plasticized with an effective amount of a plasticizer which is at least a partial ester formed by the reaction of an alcohol having from 2 to 4 hydroxyl groups and a C_{16} to C_{20} unsaturated fatty acid having a hydroxyl group attached to the acid molecule.

4,128,695

COATED STYRENIC RESIN PLATE FOR INK-ACCEPTABILITY AND PAINTABILITY

Katsuro Kikuchi, Yokohama; Shohachi Masai, Kashiwa, and Tsugane Tanaka, Musashino, all of Japan, assignors to Asahi-Dow Limited and Koyo Sangyo Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 683,082, May 4, 1976, abandoned. This application Mar. 10, 1978, Ser. No. 885,391

Claims priority, application Japan, May 10, 1975, 50-55237; Apr. 19, 1976, 51-44269

Int. Cl.[2] B32B *27/40, 3/26*

U.S. Cl. 428—423 8 Claims

1. A styrenic resin plate excellent in ink-acceptability and paintability comprising a styrenic resin substrate having coated on one surface or both surfaces thereof a layer with a composition comprising 100 parts by weight of a resin mixture consisting of 60 to 95% by weight of a hydrophobic synthetic resin and 40 to 5% by weight of a hydrophilic synthetic resin, 30 to 500 parts by weight of a finely pulverized inorganic filler and 2 to 15 parts by weight of an isocyanate compound having at least two isocyanate groups.

4,128,696

LOW PRESSURE MELAMINE RESIN LAMINATES

James C. Goebel, Stamford; Darwin F. Delapp, New Canaan, both of Conn., and Kenneth D. Bunkowski, Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Filed Feb. 11, 1977, Ser. No. 767,707

Int. Cl.[2] B32B *27/40*

U.S. Cl. 428—424 5 Claims

1. A heat and low pressure consolidated laminate comprising

(A) a self-supporting wood particleboard or wood fiberboard substrate and

(B) a decorative cellulosic paper sheet impregnated with a composition of matter comprising

(1) a blend of an aqueous melamine/formaldehyde resin solution and from about 2% to about 20%, by weight, based on the solids weight of said resin, of an ethylene glycol having a molecular weight of from about 62 to about 2100, or

(2) an aqueous solution of the resinous reaction product of (I) melamine, (II) formaldehyde and (III) from about 2% to about 20.0%, by weight, based on the total weight of melamine and formaldehyde, of an ethylene glycol having a molecular weight of from about 62 to about 2100, wherein said (1) or (2) contains, in admixture therewith,

(3) from about 2.5 to about 30.0%, by weight, based on the weight of resin solids, of an elastomer comprising

(a) an ethylene/vinyl chloride copolymer containing from about 0.5% to about 7.0%, by weight, based on the total weight of (a), of amide groups,

(b) a polyurethane resin containing from about 3.0% to about 10.0%, by weight, based on the total weight of (b), of carboxyl groups, or

(c) a butadiene/acrylonitrile copolymer containing from about 1% to about 10.0%, by weight, based on the total weight of (c), of carboxyl groups

said elastomer having a particle size of up to about 20,000 Angstroms.

4,128,697

HERMETIC GLASS-METAL COMPRESSION SEAL

William M. Simpson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

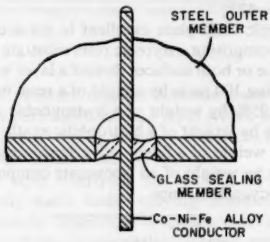
Filed Apr. 22, 1977, Ser. No. 789,963

Int. Cl.[2] B32B *17/06*

U.S. Cl. 428—433 3 Claims

1. In a hermetically sealed lead-in structure for an electronic device comprising a glass-metal compression seal which includes a steel outer member having an opening therethrough, a unitary glassy sealing member positioned in the opening in

the steel outer member and hermetically sealed to the steel, and a metallic conductor passing through the glassy sealing member and hermetically sealed thereto, wherein the steel outer member is composed of a steel having an average linear coefficient of thermal expansion (30°–300° C.) in the range of about 120–130 $\times$ 10^{-7}/° C. and the metallic conductor is composed of cobalt-nickel-iron alloy having an average linear coefficient of thermal expansion (30°–400° C.) of about 46–52 $\times$ 10^{-7}/° C., the improvement wherein the glassy sealing member is composed of a material selected from the group consisting of:



(a) a glass having an average linear coefficient of thermal expansion (0°–300° C.) of about 88.5 $\times$ 10^{-7}/° C. and a composition consisting essentially, in parts by weight, of about 63 parts SiO_2, 2.6 parts Al_2O_3, 14 parts SrO, 5.8 parts Na_2O, 8.9 parts K_2O and 3.0 parts B_2O_3, and

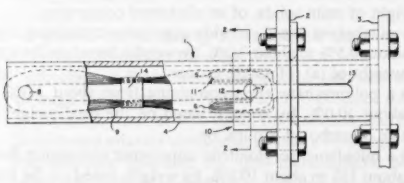
(b) a mixture having an average linear coefficient of thermal expansion (0°–300° C.) of about 84 $\times$ 10^{-7}/° C. and a composition consisting essentially of 6 parts zircon and 100 parts glass by weight, the glass consisting essentially, in parts by weight, of about 66 parts SiO_2, 12 parts BaO, 2.7 parts Al_2O_3, 2.0 parts B_2O_3, 6.7 parts Na_2O, 6.6 parts K_2O, 2.0 parts ZrO_2, 0.7 parts Li_2O and 1.6 parts F.

4,128,698

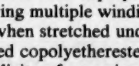
ENERGY ABSORBING MECHANISM

Colin Anolick, Howard J. Kutsch, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

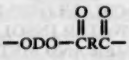
Division of Ser. No. 719,952, Sep. 2, 1976, Pat. No. 4,076,226. This application Sep. 27, 1977, Ser. No. 837,277
Int. Cl.[2] B32B *27/00*
U.S. Cl. 428—480 **3 Claims**



1. An article of manufacture suitable for use in cushioning impact comprising an oriented copolyetherester elastomer in the form of a belt having multiple windings and being capable of absorbing energy when stretched under tension upon force of impact, said oriented copolyetherester elastomer consisting essentially of a multiplicity of recurring long-chain and short-chain ester units joined head-to-tail through ester linkages, said long-chain ester units being represented by the structure:



and said short-chain ester units being represented by the structure:



wherein:

G is a divalent radical remaining after removal of terminal hydroxyl groups from poly(alkylene oxide) glycols having a molecular weight between about 400–6000;

R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300; and

D is a divalent radical remaining after removal of hydroxyl groups from a low molecular weight diol having a molecular weight less than about 250;

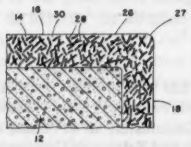
said short-chain ester units constitute about 15–95% by weight of the copolyetherester.

4,128,699

TREATED GYPSUM WALLBOARD PAPER

Donald R. Kole, Cheektowaga, and Donald A. Kossuth, Buffalo, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Oct. 3, 1977, Ser. No. 838,478
Int. Cl.[2] B32B *13/08, 29/00*
U.S. Cl. 428—498 **10 Claims**



7. An improved gypsum wallboard porous paper having cellulose fibers substantially all of which to a depth of at least about 10% of the thickness of the paper are impregnated with a drying oil.

9. Gypsum wallboard comprising a set gypsum core disposed between a face paper and a back paper, at least one of said papers having a structure as defined in claim 7.

4,128,700

FUEL CELL POWER PLANT AND METHOD FOR OPERATING THE SAME

Richard A. Sederquist, Newington, Conn., assignor to United Technologies Corp., Hartford, Conn.

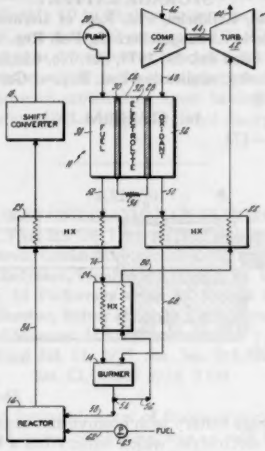
Filed Nov. 26, 1977, Ser. No. 855,118
Int. Cl.[2] H01M *8/06*
U.S. Cl. 429—17 **20 Claims**

1. In the method of operating a fuel cell power plant comprising a plurality of fuel cells, burner means, and fuel conditioning apparatus including a catalytic reactor for producing hydrogen, the steps of:

burning a mixture of fuel cell anode and cathode exhausts in said burner means;

feeding a carbonaceous fuel and a first portion of the burner

means exhaust into said fuel conditioning apparatus and reacting the fuel therein;



feeding the fuel conditioning apparatus output to the anode side of the fuel cells; and

venting a second portion of the burner means exhaust.

4,128,701

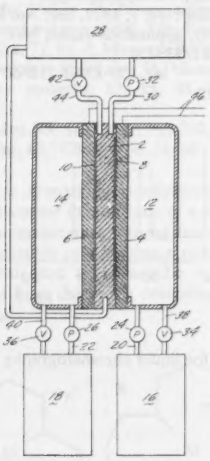
HYDROGEN/CHLORINE REGENERATIVE FUEL CELL

Donald L. Maricle, Glastonbury, Conn., assignor to United Technologies Corp., Hartford, Conn.

Filed Dec. 23, 1977, Ser. No. 863,816

Int. Cl.² H01M *8/18*

U.S. Cl. 429—21 **13 Claims**



1. A regenerative fuel cell including:

a matrix;

an electrode on each side of the matrix;

container means external to the cell for separately containing hydrogen gas and chlorine gas;

means for supplying the hydrogen gas and chlorine gas from said container means to the electrodes on the sides opposite the matrix, one gas to each electrode;

an aqueous electrolyte selected from the group consisting of sodium chloride and hydrochloric acid in said matrix in which the hydrogen chloride gas evolved is dissolved; and

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4,128,702

CELL WITH N,N-BIS (SUBSTITUTED PHENYL)-4,4-DIPYRIDINIUM SALT DEPOLARIZER

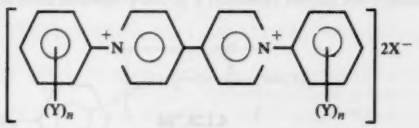
Hiroshi Okaniwa, Hachioji, and Toshiaki Yatabe, Hino, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 25, 1977, Ser. No. 854,965

Int. Cl.² H01M *4/60*

U.S. Cl. 429—27 **9 Claims**

1. In a half-cell using a cathode composition which comprises a mixture of carbon, a depolarizing compound and an electrolyte, the improvement wherein the depolarizing compound has the formula:



in which Y is selected from the group consisting of nitro and cyano groups; n is 1 or 2; and X^- is Cl^- or Br^-.

4,128,703

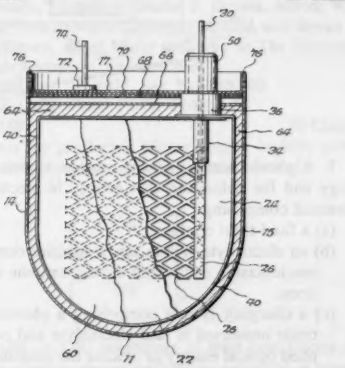
LITHIUM-IODINE CELL

Ralph T. Mead, Kenmore; Wilson Greatbatch, Clarence; Frank W. Rudolph, Depew, and Norbert W. Frenz, Jr., North Tonawanda, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,641

Int. Cl.² H01M *6/18*

U.S. Cl. 429—101 **13 Claims**



1. A lithium-iodine cell comprising:

a. a casing of electrically conducting material;

b. anode means positioned within said casing and comprising an element of lithium having an exposed surface portion and another surface portion;

c. electrical conductor means operatively connected to said other surface portion and extending through said casing, said conductor means having a longitudinal axis;

d. means for sealing said conductor means from the remainder of said cell, said sealing means comprising an insulator element in generally concentric relationship with said conductor within said casing, said insulator element having a longitudinal axis and being of a material which does not exhibit electronic conduction when exposed to iodine, said insulator having a first axial portion embracing said conductor and a second axial portion spaced from said conductor in a radial outward direction, and a ferrule

element in generally concentric relationship with said conductor, said ferrule having a portion within said casing which is received in said second portion of said insulator and a portion extending from said casing;

e. cathode means comprising iodine-containing material within said casing and in operative contact with said exposed surface portion of said lithium element and with a major portion of the surface of said casing in a manner such that said casing serves as a cathode current collector; and

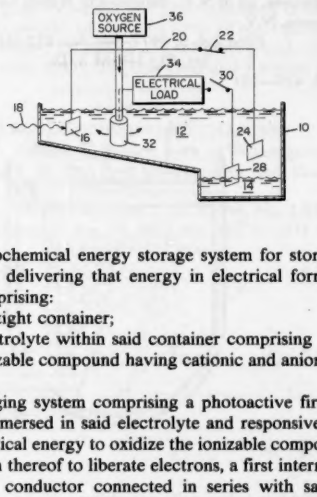
f. said sealing means shielding said conductor means from said iodine-containing material and electrically insulating said conductor means from said casing;

g. whereby an electrical potential difference exists between said conductor means and said casing during operation of said cell.

4,128,704
PHOTOELECTROCHEMICAL ENERGY STORAGE SYSTEM

Howard McKinzie, Framingham; Mark S. Wrighton, Medford, and Joseph Lester, Acton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 14, 1977, Ser. No. 850,916
Int. Cl.[2] H01M *6/30, 6/36*
U.S. Cl. 429—111 **18 Claims**



1. A photochemical energy storage system for storing energy and for delivering that energy in electrical form upon demand comprising:

(a) a fluid-tight container;

(b) an electrolyte within said container comprising at least one ionizable compound having cationic and anionic portions;

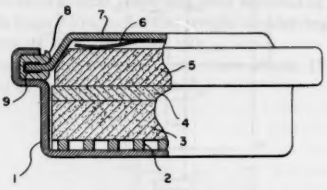
(c) a charging system comprising a photoactive first electrode immersed in said electrolyte and responsive to applied optical energy to oxidize the ionizable compound or a portion thereof to liberate electrons, a first interruptible electron conductor connected in series with said first electrode, a second electrode immersed in said electrolyte and connected to said first interruptible electron conductor for receiving the electrons to reduce the ionizable compound or a portion thereof, and storage means provided in said container for storing the product of the reduction reaction in a phase which differs from the phase of the ionizable compound; and

(d) an energy delivery system having a third electrode in said container for contacting the stored product to abstract electrons therefrom in an oxidation reaction, a second interruptible electron conductor connected in series with said third electrode, and a fourth electrode immersed in said electrolyte connected to said second interruptible electron conductor for transferring the electrons to establish a redox reaction by which said cationic and anionic portions are recombined.

4,128,705
GALVANIC ELEMENT, PARTICULARLY ALKALINE STORAGE BATTERY

August Winsel, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,160
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636230
Int. Cl.[2] H01M *2/02*
U.S. Cl. 429—171 **8 Claims**

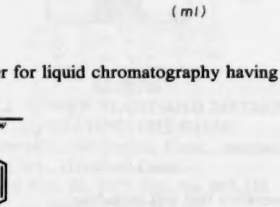


8. In a storage battery with positive and negative electrodes and alkaline electrolyte, which battery has a housing having two portions and a seal interposed between said portions to close the housing in liquid-tight manner, one portion of the housing having a metal surface bearing against the seal and also connected to the negative electrode, the improvement wherein a passive oxide layer covers the said metal surface bearing against the seal, the oxide layer being non-reducible at the potential of the negative electrode, and being selected from the group of NiO, TiO_2 and oxides of chromium and tantalum.

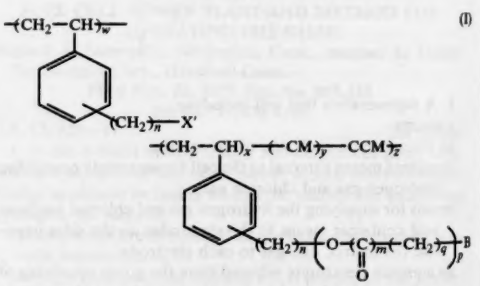
4,128,706
CARRIER FOR LIQUID CHROMATOGRAPHY

Toru Seita; Akihiko Shimizu; Yoshio Kato, and Tsutomu Hashimoto, Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Nov. 7, 1977, Ser. No. 849,466
Claims priority, application Japan, Nov. 9, 1976, 51/133761; Nov. 12, 1976, 51/135276
Int. Cl.[2] C08J *210/00*
U.S. Cl. 526—19 **2 Claims**



1. A carrier for liquid chromatography having main units



wherein n=0 or an integer of 1 to 3; m=0 or 1; q= an integer of 1 to 3; p=0 or 1; w=90 to 16 and preferably 82 to 42; x=57 to 2 and preferably 30 to 8; y=0 to 30 and preferably 0; z=5 to 30 and preferably 10 to 28; B represents adenine, guanine, thymine, uracil or cytosin; X' represents OH, Cl Br or I; CM represents styrene, a substituted styrene, acrylonitrile, a substituted acrylonitrile, acrylic acid or a substituted acrylic acid and CCM represents crosslinking agent having two or more unsaturated group such as ethylene glycol diacrylate, divinylbenzene etc.

4,128,707
METHOD FOR STABILIZATION OF FLUORO-ORGANIC COPOLYMERS OF THE ETHYLENE SERIES

Olga A. Shustova, Grokholsky pereulok 30, korpus 1, kv. 41; Georgy P. Gladyshev, Vinnitskaya ulitsa 5, kv. 111; Eduard K. Kondrashov, 13 Parkovaya ulitsa 31, korpus 1, kv. 21, and Leonid D. Shustov, bulvar generala Karbysheva 6, korpus 1, kv. 28, all of Moscow, U.S.S.R.

Filed Jul. 11, 1977, Ser. No. 814,483
Int. Cl.[2] C08F *8/18, 8/00*
U.S. Cl. 526—43 **4 Claims**

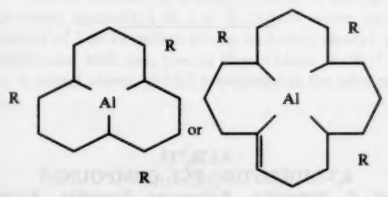
1. A method for stabilization of fluoro-organic copolymers of the ethylene series comprising mixing said fluoroorganic copolymer with xenon difluoride taken in an amount of from 0.1 to 15% by weight of the starting copolymer at a temperature of not more than 20° C.

4,128,708
PROCESS FOR PREPARING CIS-POLYISOPRENE

Alexandr G. Liakumovich, ulitsa Galeeva, 10, kv. 8, Kazan; Boris I. Pantukh, ulitsa Khudaiberdina, 162, kv. 89, Bashkirskaya ASSR, Sterlitamak; Mengzda K. Sultanova, ulitsa Kommunisticheskaya, 43, kv. 257, Bashkirskaya ASSR, Sterlitamak; Vasily P. Popov, ulitsa Revoljutsionnaya, 15, kv. 8, Bashkirskaya ASSR, Sterlitamak; Genrikh A. Tolstikov, ulitsa Dostoevskogo, 102/3, kv. 61, Bashkirskaya ASSR, Ufa; Jury B. Monakov, ulitsa Khalturina, 53/1, kv. 8, Bashkirskaya ASSR, Ufa; Valery P. Juriev, ulitsa Dostoevskogo, 102/3, kv. 14, Bashkirskaya ASSR, Ufa; Elena Y. Mandelshtam, prospekt Mira, 72, kv. 2, Moscow; Boris S. Korotkevich, ulitsa Fortunatovskaya, 31/35, kv. 71, Moscow, and Jury A. Shmuk, Leninsky prospekt, 13, kv. 31, Moscow, all of U.S.S.R.

Filed Jan. 19, 1977, Ser. No. 760,546
Int. Cl.[2] C08F *4/64, 36/08*
U.S. Cl. 526—162 **1 Claim**

1. A process for preparing cis-polyisoprene comprising polymerization of isoprene in a medium of a non-polar hydrocarbon solvent at a temperature ranging from 0° to 60° C. in the presence of a catalyst representing a reaction product of titanium tetrachloride and an intracyclic organo-aluminium compound selected from the group consisting of compounds having the formulae:



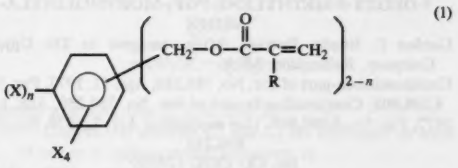
wherein R is selected from the group consisting of H and CH_3; said R radicals being the same or different; the reaction product components being taken in a titanium: aluminium molar ratio of 1:1.05–1.1 respectively; weight ratio between isoprene and said catalyst being equal to 100:0.2–0.7; and isolation of the desired product on completion of the polymerization.

4,128,709
ACRYLATE-BASED POLYMERS AND THEIR USE AS FLAMEPROOFING AGENTS

Norbert Vollkommer, Troisdorf; Egon N. Petersen, Neunkirchen-Seelscheid; Herbert Klinkenberg, Troisdorf-Eschmar, and Werner Schmidt, St. Augustin-Niederberg, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Jun. 17, 1976, Ser. No. 697,190
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1975, 2527802; Jun. 21, 1975, 2527803; Oct. 1, 1975, 2543746
Int. Cl.[2] C08F *4/04, 4/32, 18/00, 118/00*
U.S. Cl. 526—218 **27 Claims**

1. A solid homopolymer of a monomer having the formula



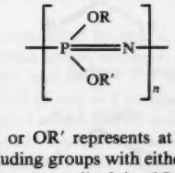
wherein n = 0 or 1, X is bromine or chlorine, R is hydrogen or methyl, said polymer having a molecular weight between 1×10^3 and 10×10^6, said molecular weight being determined by gel permeation chromatography in tetrahydrofuran.

4,128,710
PROCESS FOR THE PRODUCTION OF PHOSPHAZENE POLYMERS

John W. Fieldhouse, Mogadore; Daniel F. Graves, Akron; William M. Cole, Norton; Mark L. Stayer, Suffield, and Steven L. Fenske, Uniontown, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 25, 1977, Ser. No. 845,009
Int. Cl.[2] C08G *73/00*; C08J *3/00*
U.S. Cl. 528—168 **10 Claims**

1. In a process for producing alkoxy and/or aryloxy polyphosphazene esters represented by the general formula



wherein each OR or OR' represents at least one alkoxy or aryloxy group including groups with either saturated or unsaturated substituents and not all of the OR and OR' groups are required to be the same, and n is an integer of between about 10 and about 50,000 or more;

wherein a solution of a linear dichlorophosphazene represented by the formula $(NPCl_2)_m$ and m is an integer greater than about 7 is reacted with a solution of at least one alkoxide or aryloxide represented by the formula NaOR or NaOR';

and a solution of the desired ester is produced along with NaCl as a by-product of the reaction, the improvements which comprise;

treating the resulting solution of polyphosphazene ester and sodium chloride with CO_2 and water in an amount sufficient to neutralize any alkoxide or aryloxide present in said resulting solution;

treating the neutralized solution with an alkali metal salt solution having a density greater than the density of NaCl

to effect agglomeration of the sodium chloride produced as a by-product of said reaction; and

separating the agglomerated sodium chloride from the remaining materials present.

4,128,711
1-[[1H-PYRROL-2-YLMETHYLENE]AMINO]-2,4-IMIDAZOLIDINEDIONE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,909
Int. Cl.[2] C07D *207/50*
U.S. Cl. 542—420 **1 Claim**

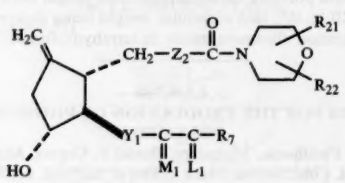
1. The compound 1-[[1H-pyrrol-2-ylmethylene]amino]-2,4-imidazolidinedione.

4,128,712
9-DEOXY-9-METHYLENE-PGF$_1$-MORPHOLINYLAMIDES

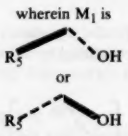
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805, Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805. This application Apr. 7, 1978, Ser. No. 894,215
Int. Cl.[2] C07C *177/00*
U.S. Cl. 542—426 **32 Claims**

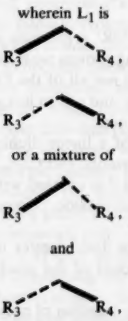
1. A prostaglandin analog of the formula



wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2CH_2—
wherein M_1 is



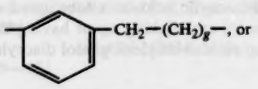
wherein R_5 is hydrogen or methyl;

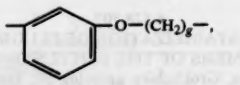


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein Z_2 is

(1) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(2) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(3) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(4) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(5) —CH_2—C≡C—$(CH_2)_g$—CH_2—,

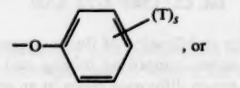

(6)

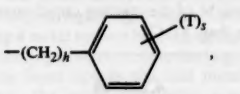

(7)

wherein g is one, 2 or 3;

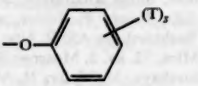
wherein R_7 is

(1) —$(CH_2)_m$—CH_3,


(2)


(3)

wherein m is one to 5, inclusive, h is zero or one, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different; and

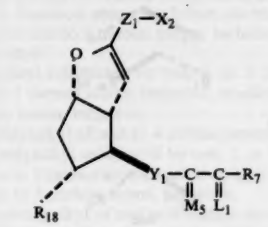
wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive.

4,128,713
6,7-DIDEHYDRO-PGI$_1$ COMPOUNDS

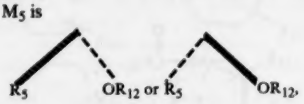
William P. Schneider, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 15, 1977, Ser. No. 860,673
Int. Cl.[2] C07D *307/93*
U.S. Cl. 542—426 **51 Claims**

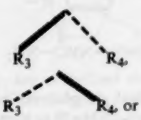
1. A prostacyclin intermediate of the formula



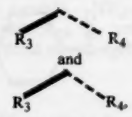
wherein Z_1 is
(1) $-(CH_2)_g-(CH_2)_2-CH_2-$, or
(2) $-(CH_2)_g-(CH_2)_2-CF_2-$,
wherein g is the integer one, 2, or 3;
wherein R_{18} is hydrogen; alkanoyloxy of two to 8 carbon atoms, inclusive, or alkanoyloxymethyl of two to 8 carbon atoms, inclusive;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) $-CH_2CH_2-$, or
(4) —C≡C—;
wherein M_5 is



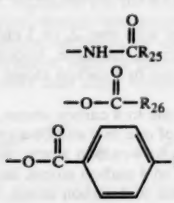
wherein R_5 is hydrogen or methyl and R_{12} is alkanoyl of two to 8 carbon atoms, inclusive;
wherein L_1 is



a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein X_2 is
(1) $-COOR_2$ wherein R_2 is alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by

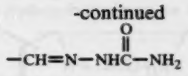


(a)

(b)

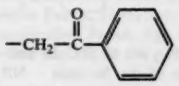
(c)

-continued

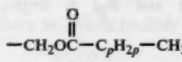


(d)

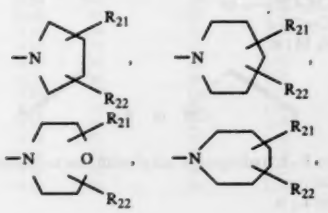
wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{26} is methyl, phenyl, $-NH_2$, or methoxy; and R_{27} is hydrogen or acetamido; phenacyl, i.e.,



or phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido;
(2)



wherein p is zero, one, 2, 3, 4, 5, or 6;
(3) $-CH_2NL_2L_3$ wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; or
(4) $-COL_4$, wherein L_4 is
(a) amino of the formula $-NR_{21}R_{22}$; wherein R_{21} and R_{22} are
(i) hydrogen;
(ii) alkyl of one to 12 carbon atoms, inclusive;
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;
(v) phenyl;
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(vii) carboxyalkyl of one to 4 carbon atoms, inclusive;
(viii) carbamoylalkyl of one to 4 carbon atoms, inclusive;
(ix) cyanoalkyl of one to 4 carbon atoms, inclusive;
(x) acetylalkyl of one to 4 carbon atoms, inclusive;
(xi) benzoylalkyl of one to 4 carbon atoms, inclusive;
(xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(xiii) pyridyl;
(xiv) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
(xv) pyridylalkyl of one to 4 carbon atoms, inclusive;
(xvi) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive;
(xvii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(xviii) dihydroxyalkyl of one to 4 carbon atoms, or
(xix) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;
(b) cycloamino selected from the group consisting of



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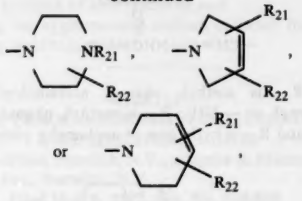


wherein R_{21} and R_{22} are as defined above;

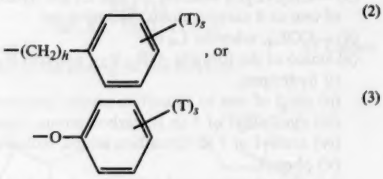
(c) carbonylamino of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

(d) sulphonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{22} are as defined above; or

(e) hydrazino of the formula $—NR_{23}R_{24}$, wherein R_{23} is as defined above and R_{24} is amino of the formula $—NR_{21}R_{22}$, as defined above, or cycloamino, as defined above;

wherein R_7 is

(1) $—(CH_2)_m—CH_3$,

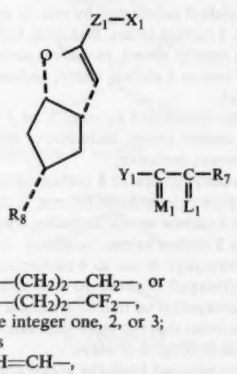


(2)

(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl.

3. A prostacyclin analog of the formula



wherein Z_1 is

(1) $—(CH_2)_g—(CH_2)_2—CH_2—$, or

(2) $—(CH_2)_g—(CH_2)_2—CF_2—$,

wherein g is the integer one, 2, or 3;

wherein Y_1 is

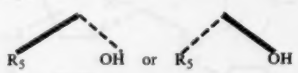
(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $—CH_2CH_2—$, or

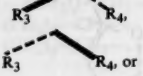
(4) —C≡C—;

wherein M_1 is

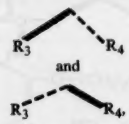


wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,

wherein L_1 is



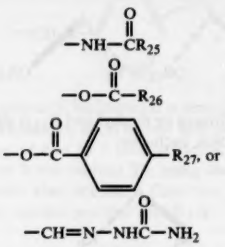
a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein X_1 is

(1) $—COOR_{10}$, wherein R_{10} is hydrogen, alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



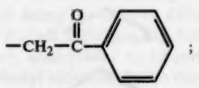
(a)

(b)

(c)

(d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{26} is methyl, phenyl, $—NH_2$, or methoxy; and R_{27} is hydrogen or acetamido; phenacyl, i.e.,



phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;

(2) $—CH_2OH$;

(3) $—CH_2NL_2L_3$ wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; or

(4) $—COL_4$, wherein L_4 is

(a) amino of the formula $—NR_{21}R_{22}$; wherein R_{21} and R_{22} are

(i) hydrogen;

(ii) alkyl of one to 12 carbon atoms, inclusive;

(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;

(iv) aralkyl of 7 to 12 carbon atoms, inclusive;

(v) phenyl;

(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;

(vii) carboxyalkyl of one to 4 carbon atoms, inclusive;

(viii) carbamoylalkyl of one to 4 carbon atoms, inclusive;

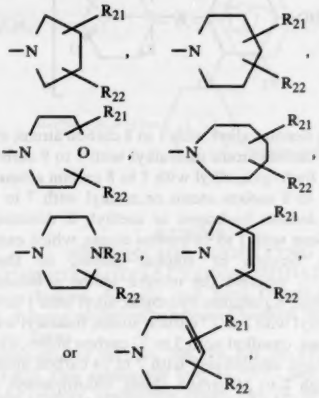
(ix) cyanoalkyl of one to 4 carbon atoms, inclusive;

(x) acetylalkyl of one to 4 carbon atoms, inclusive;

(xi) benzoylalkyl of one to 4 carbon atoms, inclusive;

(xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(xiii) pyridyl;
(xiv) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
(xv) pyridylalkyl of one to 4 carbon atoms, inclusive;
(xvi) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive;
(xvii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(xviii) dihydroxyalkyl of one to 4 carbon atoms, or
(xix) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of



wherein R_{21} and R_{22} are as defined above;

(c) carbonylamino of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

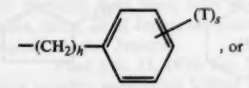
(d) sulphonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{22} are as defined above; or

(e) hydrazino of the formula $—NR_{23}R_{24}$, wherein R_{23} is as defined above and R_{24} is amino of the formula $—NR_{21}R_{22}$, as defined above, or cycloamino, as defined above;

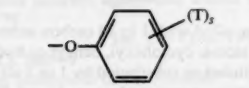
wherein R_7 is

(l) $—(CH_2)_m—CH_3$,

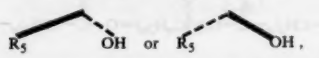
(2)



(3)



wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl, wherein M_1 is



wherein R_5 is hydrogen or methyl; and
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl.

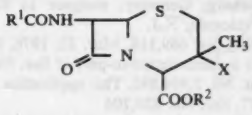
4,128,714

PROCESS FOR THE PREPARATION OF 7-ACYLAMIDA-3-HALO-3-ALKYL-CEPHAM-4-CARBOXYLIC ACIDS AND ESTERS

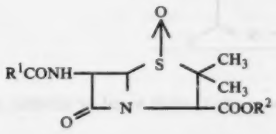
Masao Koyama, and Shigeo Seki, both of Tokyo, Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Division of Ser. No. 350,199, Apr. 11, 1973, Pat. No. 3,963,712. This application Feb. 2, 1976, Ser. No. 654,624
Claims priority, application Japan, Apr. 14, 1972, 47-36850
Int. Cl.[2] C07D *501/10*
U.S. Cl. 544—18 **8 Claims**

1. A process for the preparation of a 7-amino-cepham-4-carboxylic acid having the formula:



wherein R^1 represents benzyl or phenoxymethyl, R^2 represents methyl, benzyl, p-nitrobenzyl or trichloromethyl, and X is chlorine, bromine or iodine, comprising the step of contacting, in an inert solvent at a temperature of from 70° C. to 130° C., one molar proportion of a penicillin sulfoxide ester having the formula:



wherein R^1 and R^2 are the same as above defined, with from 1 to 2 molar proportions of a metal halide having the formula:

MX_n

wherein M is zinc, tin or mercury, X is a halogen selected from the group consisting of chlorine, bromine and iodine, and *n* is an integer from 1 to 5.

4,128,715

CEPHALOSPORIN ANTIBIOTICS

Christopher J. Sharp, Northolt, England, assignor to Glaxo Laboratories Limited, Greenford, England

Filed Apr. 27, 1977, Ser. No. 791,529
Claims priority, application United Kingdom, Apr. 28, 1976, 17307/76
Int. Cl.[2] C07D *501/20*
U.S. Cl. 544—22 **1 Claim**

1. The crystalline form of L-lysine salt of cefuroxime characterised by the following X-ray diffraction data:

Line number	d (A)	Relative Intensity	Line number	d (A)	Relative Intensity
1	13.59	100	19	3.26	12
2	10.46	80	20	3.18	12
3	9.18	16	21	3.06	19
4	8.40	75	22	2.97	10
5	6.88	56	23	2.82	14
6	6.31	16	24	2.78	7
7	5.80	2	25	2.69	4
8	5.48	6	26	2.64	17
9	5.23	14	27	2.47	6
10	4.79	52	28	2.38	8
11	4.74	40	29	2.32	6
12	4.58	16	30	2.25	9
13	4.41	76	31	2.03	4

-continued

Line number	d (A)	Relative Intensity	Line number	d (A)	Relative Intensity
14	4.11	40	32	1.99	2
15	3.98	52	33	1.95	1
16	3.82	16	34	2.10	1
17	3.61	71	35	1.90	4
18	3.42	17	36	1.81	5

4,128,716

4-HALO DERIVATIVES OF PYRAZOLO[1,5-a]-QUINOXALINE-3-CARBOXYLIC ACIDS AND ESTERS

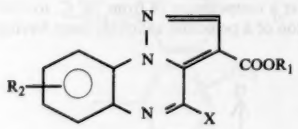
Uwe D. Treuner, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 669,114, Mar. 22, 1976, Pat. No. 4,052,393, which is a continuation-in-part of Ser. No. 628,277, Nov. 3, 1975, Pat. No. 3,994,893. This application Sep. 13, 1977, Ser. No. 833,104

Int. Cl.[2] **A61K** *31/495;* **C07D** *487/04*

U.S. Cl. 544—346 **7 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, lower alkyl, alkali metal or alkaline earth metal;

R_2 is hydrogen, lower alkyl, halogen or lower alkoxy; and X is halogen.

4,128,717

DERIVATIVES OF 5,6-DIHYDROBENZO[5,6]CYCLOHEPTA[1,2-b] PYRAZOLO-[4,3-e]PYRIDIN-11 (1H)-ONES AND 11 (1H)-IMINES

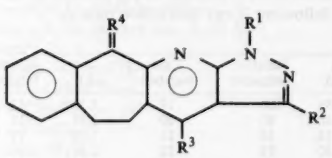
Hans Hoehn, Tegernheim, Germany; Jack Bernstein, New Brunswick, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 753,116, Dec. 22, 1976, Pat. No. 4,062,858. This application Jul. 20, 1977, Ser. No. 817,281

Int. Cl.[2] **C07D** *471/04*

U.S. Cl. 544—361 **10 Claims**

1. A compound of the formula



wherein R^1 is lower alkyl, phenyl or phenyl-lower alkyl;

R^2 is hydrogen, lower alkyl or phenyl;

R^3 is piperazine or piperazine substituted with a lower alkyl or hydroxy-lower alkyl group;

R^4 is oxo, lower alkylimino or phenylimino; and physiologically acceptable acid addition salts thereof.

4,128,718

HYDROXYPHENYLATED HYDANTOINS

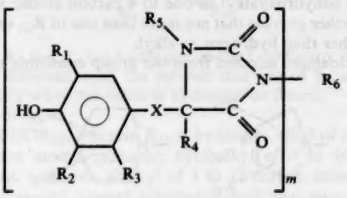
Andreas Schmidt, Reinach, Switzerland; Janet B. Peterson, Yonkers, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 614,039, Sep. 17, 1975, Pat. No. 4,044,019, which is a division of Ser. No. 469,717, May 14, 1974, Pat. No. 3,939,175, which is a continuation-in-part of Ser. No. 357,744, May 7, 1973, abandoned. This application Mar. 17, 1977, Ser. No. 778,654

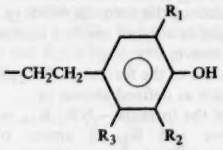
Int. Cl.[2] **C07D** *233/78, 235/02*

U.S. Cl. 548—313 **6 Claims**

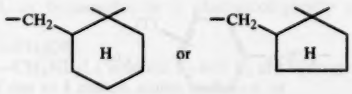
1. A compound of the formula



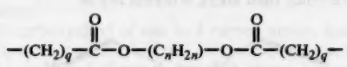
wherein R_1 denotes alkyl with 1 to 8 carbon atoms, cycloalkyl with 6 to 8 carbon atoms or aralkyl with 7 to 9 carbon atoms; R_2 denotes hydrogen, alkyl with 1 to 8 carbon atoms, cycloalkyl with 6 to 8 carbon atoms or aralkyl with 7 to 9 carbon atoms; R_3 denotes hydrogen or methyl; X denotes a direct bond, alkylene with 1 to 18 carbon atoms, which can be interrupted by oxygen or sulphur atoms, or the radical —O—CH_2—, wherein the oxygen atoms is bonded to the phenol radical; R_4 denotes hydrogen, alkyl with 1 to 17 carbon atoms, alkenyl with 2 to 17 carbon atoms, thiaalkyl with 3 to 21 carbon atoms, oxaalkyl with 3 to 21 carbon atoms, cyclohexyl, benzyl, phenyl, alkylphenyl with 7 to 14 carbon atoms, alkoxyphenyl with 7 to 24 carbon atoms, chlorophenyl, dichlorophenyl, naphthyl or a group



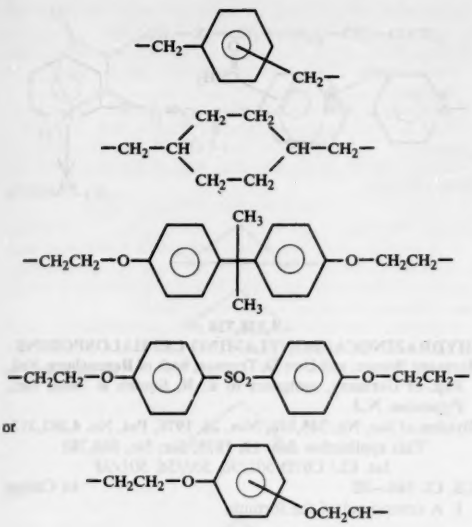
or X and R_4 conjointly with the carbon atom in the 5-position of the hydantoin ring denote one of the radicals



R_5 denotes hydrogen, alkyl with 1 to 18 carbon atoms, alkenyl with 3 to 18 carbon atoms, cyclohexyl, benzyl or hydroxybenzyl which is unsubstituted or substituted by 1 to 3 alkyl groups each with 1 to 4 carbon atoms; m denotes 2, and R_6 denotes alkylene with 1 to 18 carbon atoms, oxaalkylene with 4 to 21 carbon atoms, wherein the carbon atom bonded to the nitrogen does not carry any further hetero-atoms, thiaalkylene with 4 to 21 carbon atoms, wherein the carbon atom bonded to nitrogen carries no further hetero-atoms, or one of the groups



wherein q is 1 or 2 and n is 2 to 18,



or

4,128,719

PROCESS FOR PRODUCING 4-CARBOXAMIDO-5-CYANO-2-IMIDAZOLONE

Takakazu Kojima, Yamato, and Yozo Ohtsuka, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Continuation of Ser. No. 708,974, Jul. 26, 1976, Pat. No. 4,093,810. This application Dec. 16, 1977, Ser. No. 861,324
Claims priority, application Japan, Jul. 25, 1975, 50-90211
Int. Cl.[2] C07D *233/90*
U.S. Cl. 548—321 **2 Claims**

1. A process for producing 4-carboxamido-5-cyano-2-imidazolone which comprises reacting diaminomaleonitrile in the presence of sodium cyanide as a basic catalyst with carbon dioxide in an organic solvent selected from the group consisting of dimethylsulfoxide, N,N-dimethylformamide, an alcohol having 1 to 4 carbon atoms, tetrahudrofuran, dioxane, diethyl ether, dimethoxyethane, pyridine, acetonitrile and ethyl acetate at a temperature of from about 0° C. to about 60° C.

4,128,720

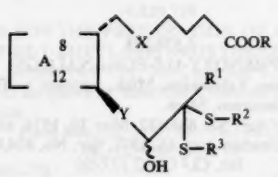
PROSTAGLANDIN ANALOGUES

Masaki Hayashi; Seiji Kori, both of Takatsuki, and Hajimu Miyake, Suita, all of Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

Filed Feb. 11, 1976, Ser. No. 657,125
Claims priority, application United Kingdom, Feb. 14, 1975, 6385/75
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—9 **5 Claims**

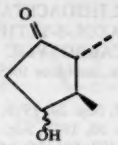
1. A compound of the formula:

VI

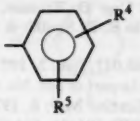


wherein A represents a grouping of the formula:

VIIB



x represents ethylene, Y represents trans-vinylene, R represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, R^1 represents a hydrogen atom or a straight- or branched-chain alkyl groups containing from 1 to 10 carbon atoms, R^2 represents a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, R^3 represents a grouping of the formula:



wherein R^4 and R_5 each represents a hydrogen or halogen atom, a trifluoromethyl group or an alkyl group containing from 1 to 3 carbon atoms and cyclodextrin clathrates of such acids and esters and, when R represents a hydrogen atom, non-toxic salts of such acids.

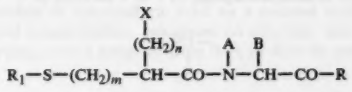
4,128,721

AMINO ACID DERIVATIVES

Miguel A. Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 747,282, Dec. 3, 1976, Pat. No. 4,091,024. This application Feb. 21, 1978, Ser. No. 879,410
Int. Cl.[2] C07C *149/23, 153/07*
U.S. Cl. 560—16 **10 Claims**

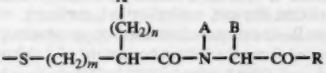
1. A compound of the formula



and salts thereof,

wherein R is hydroxy or lower alkoxy;

R_1 is hydrogen, lower alkanoyl, benzoyl or



A is hydrogen, lower alkyl or hydroxy-lower alkylene;

B is phenyl, phenyl-lower alkylene or hydroxyphenyl-lower alkylene;

X is carboxy, lower alkoxycarbonyl, carbamoyl, N-substituted carbamoyl wherein the N-substituent is lower alkyl or phenyl-lower alkylene, or cyano;

m is 0 or 1; and

n is 0, 1, 2, 3 or 4.

4,128,722
7-TRIFLUOROMETHYLTHIOACETAMIDO-3-(3-SULFOMETHYL-1,2,4-TRIAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 726,377, Sep. 24, 1976, Pat. No. 4,083,975. This application Jan. 30, 1978, Ser. No. 873,561
Int. Cl.[2] C07D *501/50, 501/36;* A61K *31/545*
U.S. Cl. 544—26 2 Claims

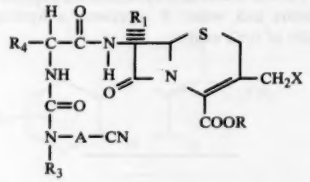
1. 7-Trifluoromethylthioacetamido-3-(3-sulfomethyl-1,2,4-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid or its non-toxic pharmaceutically acceptable alkali metal salts.

4,128,723
CYANOALKYLUREIDO CEPHALOSPORINS

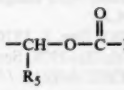
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 765,037, Feb. 2, 1977, Pat. No. 4,096,329, which is a continuation-in-part of Ser. No. 664,128, Mar. 5, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,602
Int. Cl.[2] C07D *501/36, 501/32, 501/46*
U.S. Cl. 544—25 9 Claims

1. A compound of the formula:

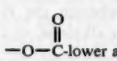


wherein R is hydrogen, straight or branched chain alkyl of 1 to 4 carbons, benzyl, phenethyl, diphenylmethyl, trimethylsilyl, 2,2,2-trichloroethyl, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylenediamine, methylamine, triethylamine, N-ethylpiperidine, or

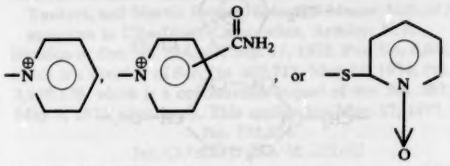


R_1 is in the α-configuration and is hydrogen or methoxy; A is straight or branched alkylene of 1 to 8 carbons or

R_2 is phenyl, 2-thienyl, or 3-thienyl; R_3 is hydrogen or lower alkyl wherein lower alkyl is straight or branched chain of 1 to 8 carbons; R_4 is phenyl, benzyl, phenethyl, substituted phenyl, benzyl or phenethyl wherein said substituent is on the phenyl ring and is one or two members selected from the group consisting of chloro, bromo, methyl, ethyl, methoxy, ethoxy and hydroxy, or R_4 is a mono-substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, and 3-furyl wherein said heterocyclic substituent is attached at an available carbon atom and is chloro, bromo, methyl, or ethyl; R_5 is hydrogen or straight or branched chain alkyl of 1 to 4 carbons; R_6 is straight or branched chain alkyl of 1 to 4 carbons; and X is hydrogen



and lower alkyl is straight or branched chain of 1 to 4 carbons,

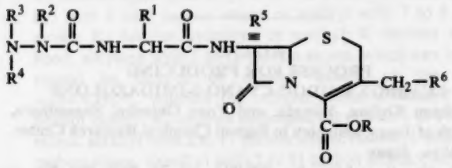


4,128,724
HYDRAZINOCARBONYLAMINO CEPHALOSPORINS

Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 745,156, Nov. 26, 1976, Pat. No. 4,091,212. This application Jan. 12, 1978, Ser. No. 868,781
Int. Cl.[2] C07D *501/36, 501/56, 501/32*
U.S. Cl. 544—30 14 Claims

1. A compound of the formula



wherein

R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, trihaloethyl, tri(lower alkyl)silyl, tri(lower alkyl)stannyl or a salt forming ion of the group consisting of aluminum, alkali metal, alkaline earth metal, cyclo-lower alkylamine, dicyclo-lower alkylamine and lower alkylamine;

R^1 is hydrogen, lower alkyl, thienyl, furyl, pyridyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopentenyl, cyclohexenyl, cyclohexadienyl, phenyl, mono-substituted phenyl wherein the phenyl substituent is halo, lower alkyl or lower alkoxy,

R^2 and R^3 each is hydrogen or lower alkyl;

R^4 is hydrogen, lower alkyl, lower alkanoyl, halo-lower alkanoyl, cyanoacetyl or substituted cyanoacetyl wherein the cyanoacetyl substituent is lower alkyl or cyclo-lower alkyl;

R^5 is hydrogen or methoxy;

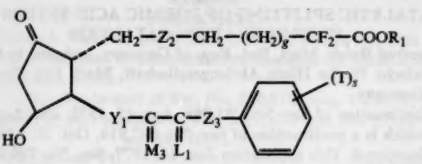
R^6 is hydrogen, lower alkanoyloxy, pyridyl, substituted pyridyl wherein the pyridyl substituent is carbamoyl, or —S— pyridyl-N-oxide.

4,128,725
16-PHENOXY-11β-PGE-ANALOGS

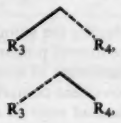
Ernest W. Yankee, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 684,637, May 10, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,871
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 15 Claims

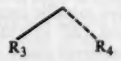
1. A prostaglandin analog of the formula



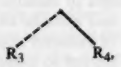
wherein L_1 is



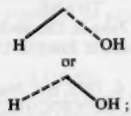
or a mixture of



and



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein M_3 is



wherein T is chloro, fluoro, trifluoromethyl, alkyl of 1 to 3 carbon atoms, inclusive, or alkoxy of 1 to 3 carbon atoms, inclusive, and s is 0, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is trans-CH=CH— or $—CH_2CH_2—$;
wherein Z_2 is
(1) cis-CH=CH, or
(2) $—(CH_2)_2—$;
wherein g is 1, 2, or 3; and
wherein R_1 is hydrogen, alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of 1 to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

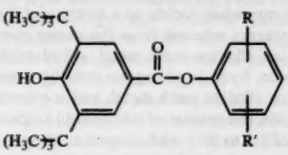
4,128,726

PROCESS FOR THE PREPARATION OF ARYL ESTERS OF 3,5-DI-T-BUTYL-4-HYDROXYBENZOIC ACID

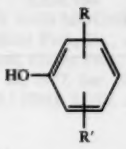
Vincent G. Grosso, New City, N.Y., and Ray L. Hillard, Annandale, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 22, 1977, Ser. No. 863,378
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—72 **4 Claims**

1. In a process for the preparation of compounds having the formula



wherein R and R′ are, individually, hydrogen or lower alkyl of 1–4 carbon atoms, inclusive, at least one of R and R′ being alkyl, whereby 3,5-di-t-butyl-4-hydroxybenzoic acid is reacted with a phenol having the formula



wherein R and R′ are as defined above in the presence of phosphorus oxychloride, the improvement which comprises conducting the reaction in the presence of a non-reactive organic solvent comprising di-n-butyl ether.

4,128,727

PROCESS FOR THE MANUFACTURE OF ACETIC ACID ETHYL ESTER

Ernst I. Leupold, Westerfeld; Hans-Jürgen Arpe, Fischbach, Taunus; Albert Renken, Hofheim, Taunus, and Ernst-Günther Schlosser, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 731,767, Oct. 12, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,534
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1975, 2545845
Int. Cl.[2] C07C *67/05*
U.S. Cl. 560—247 **12 Claims**

1. In a process for the manufacture of acetic acid ethyl ester by reaction of acetic acid and ethylene in the gaseous phase in the presence of an acidic catalyst, the improvement which comprises passing ethylene and acetic acid over a fixed-bed catalyst at a temperature of from 130° to 170° C., the catalyst being composed of silicon dioxide having a surface area of from 50 to 200 m^2/g and being impregnated with H_2SO_4, diethylsulfate or ethylsulfuric acid, or a mixture thereof, the acetic acid concentration, calculated on ethylene, uninterruptedly varying over a range of from 0.01 to 40% by mole.

4,128,728

PRODUCTION OF 2,3,6-TRIMETHYLPHENOL

Lothar Arnold, Heidelberg; Heinrich Pasedach, and Horst Pommer, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Mar. 4, 1969, Ser. No. 804,282
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1968, 1668874; Jul. 26, 1968, 1793037
Int. Cl.[2] C07C *37/06, 45/00*
U.S. Cl. 568—799 **10 Claims**

1. A process for the production of 2,3,6-trimethylphenol which comprises reacting a carbonyl compound selected from the group consisting of methyl vinyl ketone, methyl β-hydroxyethyl ketone, methyl β-methoxyethyl ketone, methyl β-phenoxyethyl ketone, methyl β-acetyloxyethyl ketone, methyl β-benzoyloxyethyl ketone, methyl β-methyl-sulfonyloxyethyl ketone, methyl β-phenylsulfonyloxyethyl ketone, methyl β-dimethylaminoethyl ketone, methyl β-chloroethyl ketone,

dimethyl-(β-acetylethyl)-sulfonium bromide or trimethyl-(β-acetylethyl)-ammonium iodide to a mixture of diethyl ketone and a basic reagent selected from the group consisting of an alkali metal, an alkaline earth metal, a hydroxide, oxide, alcoholate, amide, hydride or organo metallic compound of an alkali metal or alkaline earth metal, and a quaternary ammonium hydroxide, the amount of said diethyl ketone being in the molar ratio of 1:1 to 50:1 with respect to the total amount of carbonyl compound added, at a reaction temperature of 20° to 150° C. to produce 2,3,6-trimethyl-2-cyclohexen-1-one, and dehydrogenating the latter to produce 2,3,6-trimethylphenol.

4,128,729

BICYCLO[2.2.2]-OCTENE DERIVATIVES AND MIXTURES THEREOF

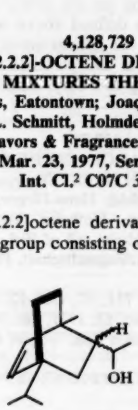
James M. Sanders, Eatontown; Joaquin F. Vinals, Red Bank, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,685

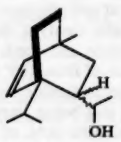
Int. Cl.[2] C07C *33/05*

U.S. Cl. 568—820 **2 Claims**

1. A bicyclo[2.2.2]octene derivative having the formula selected from the group consisting of:



and



or a mixture thereof wherein the wavy lines represent exo and endo configurations of the ethanol moiety with respect to the carbon-carbon double bond of the bicyclo[2.2.2]octene moiety.

4,128,730

CATALYTIC SPLITTING OF FORMIC ACID ESTERS ON HYDROGENATION CATALYSTS

Manfred Reich, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 281,986, Aug. 18, 1972, abandoned, which is a continuation of Ser. No. 867,914, Oct. 20, 1969, abandoned. This application Jan. 14, 1977, Ser. No. 759,802

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1968, 1805403

Int. Cl.[2] C07C *29/24*

U.S. Cl. 568—914 **21 Claims**

1. In a process for reducing the amount of formic acid ester in an alkanolic admixture thereof prepared in the oxo synthesis, said formic acid ester consisting of a reaction product of said oxo synthesis, the improvement comprising:

a splitting said formic acid ester in a predominantly liquid state to predominantly the corresponding alcohol by introducing the formic acid ester into a reactor, hydrogenating the formic acid ester in contact with a supported catalytically effective metallic catalyst in a solid bed at a temperature of about 120° to 250° C. and a pressure of about 0 to 350 atmospheres gauge, said supported metallic catalyst consisting essentially of per 100 parts by weight, (a) from 10 to 99 parts by weight of support, and (b) from 90 to 1 part by weight of metallic catalyst calculated on the metal content, said metallic catalyst consisting essentially of a mixture of reduced copper and nickel salts in which the ratio of copper to nickel is from 10:90 to 99:1.

4,128,731

PREPARATION OF 1,1,1-TRICHLORO-2,2-BIS(4-HYDROXYPHENYL)ETHANE

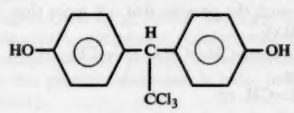
Howard J. Klopfer, and John R. Campbell, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 6, 1977, Ser. No. 803,650

Int. Cl.[2] C07C *39/24*

U.S. Cl. 568—726 **3 Claims**

1. The process for making a trichloro-ethane of the formula



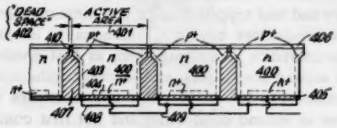
which comprises reacting at a temperature of from 15° to below 50° C. under condensation conditions phenol and chloral in a solvent medium consisting essentially of aqueous sulfuric acid of 76.7 to 85.4% concentration.

4,128,732

SOLAR CELL

Roy Kaplow, Newton, and Robert I. Frank, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 824,974, Aug. 15, 1977, abandoned. This application Jan. 23, 1978, Ser. No. 871,496
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 PC 31 Claims



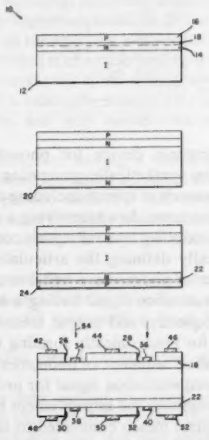
1. A semiconductor solar-cell array comprising a plurality of spaced, elongate, parallel units formed from a common substrate, the body material of each of said units being comprised of a first conductivity type and having the same spaced relation to the body material of other of said units as in the original substrate from which they are formed, each unit having upstanding sidewalls, and having therebetween an upper surface adapted for exposure to receive incident radiation and a lower surface, adjacent sidewalls of adjacent units having therebetween a first space portion extending from the lower surface to a point close to but short of the upper surface and a second substantially smaller space portion, connected to the first space portion and extending from said point to the upper surface, at least one sidewall of each unit including a localized region of a second conductivity type, and ohmic connections extending between the second conductivity type region of one unit and a first conductivity type region of an adjacent unit.

4,128,733

MULTIJUNCTION GALLIUM ALUMINUM ARSENIDE-GALLIUM ARSENIDE-GERMANIUM SOLAR CELL AND PROCESS FOR FABRICATING SAME

Lewis M. Fraas, Malibu; Kenneth R. Zanio, Agoura, and Ronald C. Knechtli, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 27, 1977, Ser. No. 864,300
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 SJ 8 Claims



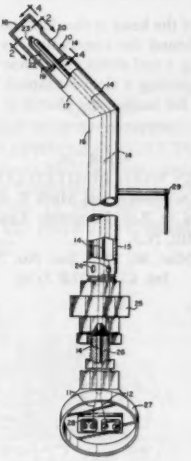
1. A multi-junction semiconductor solar cell comprising:
(a) a gallium arsenide substrate having an outer III–V semiconductor layer thereon establishing a first PN junction of a first bandgap energy equal to that of GaAs,
(b) an intermediate semiconductor material disposed on the opposite side of said gallium arsenide substrate and doped to provide a given conductivity, and
(c) a layer of germanium also doped to provide a given conductivity and disposed on said intermediate semiconductor material, said germanium layer defining a second PN junction of a second bandgap energy equal to that of Ge whereby said first and second PN junctions provide an optimized wavelength response to solar energy impinging on said solar cell.

4,128,734

THERMOCOUPLE AND MOUNTING THEREFOR

John F. Straitz, III, Elkins Park, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Nov. 22, 1977, Ser. No. 854,050
Int. Cl.[2] H01L *35/02, 35/28*
U.S. Cl. 136—232 7 Claims



1. In combination
a thermocouple having a tubular enclosing sheath with a closed terminal end,
said thermocouple having an end portion within said sheath for activation,
a continuous elongated mounting tube in enclosing relation to said thermocouple and said sheath and having an end closure at its upper end and a transverse wall spaced from said end closure and through which said enclosing sheath of said thermocouple extends,
said mounting tube between said end closure and said transverse wall having in a side portion thereof an opening through which radiant heat is effective on said end portion of said thermocouple.

4,128,735

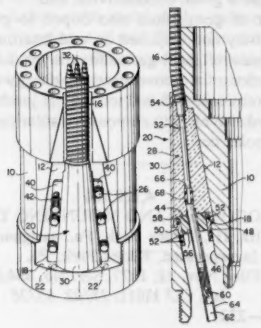
ATTACHMENT OF ELECTRIC CABLE TO SUBMERGIBLE PUMP MOTOR HEADS

James N. Zehren, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 17, 1977, Ser. No. 759,990
Int. Cl.[2] H02K *5/22;* H02G *15/00;* F04B *39/00*
U.S. Cl. 174—65 R 19 Claims

13. A device for attaching an end of a multi-conductor electric cable to the head of a motor or the like having a depression at one side thereof and having an opening into the head at one end of the depression, said device comprising a compression block having passages therethrough for receiving

corresponding cable conductors and for sealing the conductors therein when the block is compressed, said block being shaped to be received in said recess with said passages extending toward said opening, means for compressively clamping the



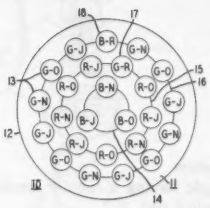
block to said side of the head in the depression with one end of the passages positioned for connection to said opening, and means for providing a seal about said connection, the last-mentioned means comprising a sleeve adapted to fit said opening and having means for sealing the sleeve in the opening.

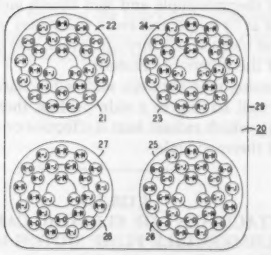
4,128,736

CABLE DESIGN WITH LIMITED COLOR CODING

Wendell G. Nutt, Dunwoody, and Mark E. Roach, Duluth, both of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 30, 1977, Ser. No. 782,722
Int. Cl.[2] H01B 7/36
U.S. Cl. 174—112 **12 Claims**





1. A telecommunications cable comprising:

a plurality of insulated conductors where each conductor has some color identification on its insulation and where said conductors are twisted into conductor pairs, each pair having a first and second conductor with said conductors within each said pair being visibly distinguishable from each other by color;

said conductors being assembled into at least one group having a center layer of nonmarker pairs and at least one layer of pairs surrounding said center layer, where each said surrounding layer comprises at least one marker pair having a unique color combination in said group, and other nonmarker conductor pairs having repeating color combinations in said group and being arranged with respect to said marker pair so that each repeating color combination pair can be uniquely identified by its position with respect to said marker pair;

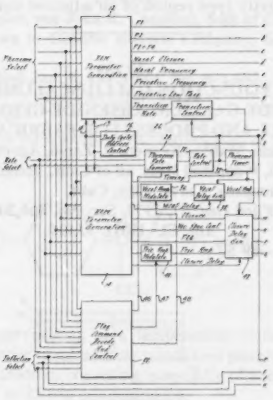
and where at least said nonmarker pairs or said center layer pairs and said repeating color combination pairs comprise first conductors having a commonality in visible color characteristics identifying them as first conductors and not second conductors, and second conductors having a commonality in visible color characteristics identifying them as second conductors and not first conductors, to thereby render said cable substantially amendable to routine random splicing of pairs with quick and ready visual identification of first and second conductors.

4,128,737

VOICE SYNTHESIZER

Mark V. Dorais, Detroit, Mich., assignor to Federal Screw Works, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,495
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SM **66 Claims**



1. In an electronic device for phonetically synthesizing human speech by synthetically generating and combining the basic phonetic sounds in speech including input means responsive to successive input data identifying a desired sequence of phonemes for producing control signals comprising the parameters electronically defining the articulation patterns of said desired sequence of phonemes, a vocal source adapted to produce a voiced excitation signal having associated therewith a fundamental frequency, and output means responsive to said control signals for electronically forming the articulation patterns of said desired sequence of phonemes and further responsive to said voiced excitation signal for producing said desired sequence of phonemes; the improvement comprising:

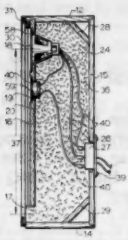
inflection control means connected to said vocal source for automatically varying the fundamental frequency of said voiced excitation signal in accordance with certain of said control signals produced by said input means.

4,128,738

COMPACT TRANSMISSION LINE LOUDSPEAKER SYSTEM

Thomas W. Gallery, 452 Poplar, Wyandotte, Mich. 48192

Filed Sep. 28, 1978, Ser. No. 727,469
Int. Cl.[2] H04R *1/28*
U.S. Cl. 179—1 E **11 Claims**



1. In a compact loudspeaker system wherein an enclosure is provided which is characterized by a short non-folded transmission line completely filled with non-woven randomly oriented fibers and the performance of said system is relatively independent of the volume of said enclosure and port area at the end of said transmission line the combination of;

a loudspeaker enclosure having a non-folded transmission line whose length is within the range of about 24 to about 48 inches;

a loudspeaker mounted on said enclosure, at one end of said transmission line, and having a radiator front surface facing exteriorly and a radiator rear surface facing interiorly of the enclosure and communicating with said transmission line;

a port in said enclosure at the other end of said transmission line having an area greater than the projected area of the radiator front surface of said loudspeaker and communicating the interior of the enclosure to the exterior; and

a packing medium of non-woven randomly oriented wool fibers having a density within the range of about 12 ounces to about 30 ounces per cubic foot and completely filling the transmission line from said loudspeaker to said port whereby said loudspeaker is acoustically coupled to said port by a short non-folded transmission line completely filled with non-woven randomly oriented fibers of relatively high density.

5. A compact loudspeaker system adapted for the reproduction of sound with minimum distortion wherein a ported enclosure is provided having an acoustic circuit for the transmission of sound waves from the rear of a loudspeaker means mounted on said enclosure which is characterized by a short non-folded transmission line completely filled with non-woven randomly oriented fibers and is relatively independent in performance of the interior volume and port means area of said enclosure comprising:

a loudspeaker enclosure having a non-folded transmission line, said enclosure including a top, bottom, front, rear and pair of side panels, whereby said transmission line is formed by the interior walls of said panels;

first loudspeaker means having front and rear radiating surfaces;

means mounting said first loudspeaker means on said enclosure such that said front surface faces exteriorly of the enclosure and said rear surface faces interiorly of the enclosure;

second loudspeaker means having front and rear radiating surfaces;

means mounting said second loudspeaker means on said enclosure such that said front surface thereof faces exteriorly of the enclosure and said rear surface thereof faces interiorly of the enclosure;

port means in said enclosure communicating the interior of the enclosure to the exterior whose area is greater than the projected area of the front radiating surface of said first loudspeaker means and spaced within the range of about 24 to 48 inches from said first loudspeaker means whereby the distance of said port means from said first loudspeaker means defines the length of said transmission line and the performance of said compact loudspeaker system is relatively independent of the area of said port means;

a packing medium comprised of non-woven randomly oriented fibers having a density within the range of about 12 ounces to about 30 ounces per cubic foot and completely filling the interior of said enclosure, whereby said first loudspeaker means is acoustically coupled to said port means by a short non-folded fiber filled transmission line of relatively high density; and

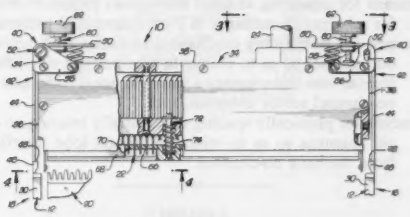
means acoustically isolating said second loudspeaker means from said packing medium.

4,128,739

FRONT TAP SHOE FOR MOUNTING ON TEST BLOCK FOR TELEPHONE CONDUCTOR PAIRS

Albert Bernstein, Santa Monica, Calif., assignor to Communications Technology Corporation, Los Angeles, Calif.

Filed Sep. 13, 1977, Ser. No. 832,886
Int. Cl.[2] H01R *13/44;* H04M *3/22*
U.S. Cl. 179—1 PC **4 Claims**



1. A front tap shoe for mounting on a test block for telephone conductor pairs, or the like, the shoe comprising a generally rectangular housing having ends and having front and rear sides, the shoe being provided at its ends with clamps for engagement with the test block, each of said clamps including:

(a) an L-shaped member having a first arm adjacent and overlying the corresponding end of said housing and terminating in a hook, and having a second arm overlying and spaced from said rear side of said housing;

(b) mounting means connecting said L-shaped member to said housing and providing for pivotal movement of said member relative to said housing about a transverse axis paralleling the intersection of said rear side of said housing and the corresponding end of said housing, and for translational movement of said member relative to said housing in a direction generally parallel to the corresponding end of said housing;

(c) spring means between said second arm of said L-shaped member and said rear side of said housing for biasing said first arm of said member toward the corresponding end of said housing and for biasing said second arm of said member away from said rear side of said housing; and

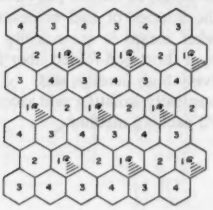
(d) screw means carried by said second arm of said L-shaped member and engagable with said rear side of said housing.

4,128,740

ANTENNA ARRAY FOR A CELLULAR RF COMMUNICATIONS SYSTEM

Victor Graziano, Oak Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 14, 1977, Ser. No. 768,260
Int. Cl.² H04Q *7/04*
U.S. Cl. 179—2 EB **13 Claims**



1. A cellular RF Communications System for a plurality of mobile transceivers in a given geographical area of a cellular communications system, the system comprising:

an array of antennas made of a plurality of subarrays, each subarray having a number of cells,

a plurality of sector antennas located substantially at the center of each cell,

means for operating each of the sector antennas of cells of each subarray to provide a predetermined communication channel to the mobile transceivers which is different from that provided by the other sector antennas of the same cell, and

means for repeating channel allocations to sector antennas for subarray to subarray in a predetermined pattern,

means for positioning co-channel antennas with respect to one another so as to eliminate substantially side lobe and frontal lobe interferences from adjacent side and front co-channel sector antennas, and

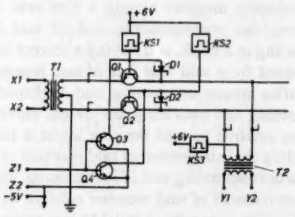
means for physically spacing and spatially relating co-channel antennas so as to minimize frontal lobe interference from the back co-channel.

4,128,741

ELECTRONIC CROSSPOINT ARRAY

Olaf Sternbeck, Bromma, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 25, 1977, Ser. No. 845,279
Claims priority, application Sweden, Nov. 2, 1976, 7612207
Int. Cl.² H04Q *1/52*
U.S. Cl. 179—18 GF **4 Claims**



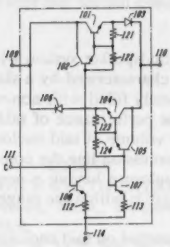
1. Improved cross-point array for telecommunication systems, produced as an *xy*-matrix in a monolithic substrate with switching means arranged at the cross-points between the *x* and *y* conductors in the form of transistors controllable to assume an "on" state with a low impedance and an "off" state with a high impedance, the transistors having their collector-emitter path connected between the *x* and *y* conductors and supplied with current from a constant-current generator and control means for switching the transistors between the "off" and "on" states, the improvement comprising that the collector-base diode of each of the transistors is connected in parallel with a Schottky-diode supplied with current from a second constant-current generator and operating in its forward direction in the "on" state, whereby cross-talk caused by a parasitic transistor function is inhibited between the cross-points in the substrate.

4,128,742

RUGGED CROSSPOINTS FOR COMMUNICATION SYSTEMS

James A. Davis, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 15, 1977, Ser. No. 824,851
Int. Cl.² H04Q *3/52*
U.S. Cl. 179—18 GF **8 Claims**



1. An analog switching circuit arrangement comprising:

first and second transmission terminals; and

a crosspoint comprising: first and second Darlington connected pairs of transistors connected in complementary relation to form two oppositely poled transmission paths between said first and second transmission terminals, each of said paths comprising a Darlington connected pair of transistors and one additional series connected semiconductor junction; and control means for selectively supplying control current to said Darlington pairs to place all of said transistors in the conducting state at the same time.

4,128,743

CIRCUIT ARRANGEMENT FOR BLOCKING A BIDIRECTIONAL AMPLIFIER AGAINST RECEIVING OUTGOING SIGNALS

Josef Huellwegen, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Sep. 30, 1976, Ser. No. 728,438
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543861
Int. Cl.² H04B *1/58, 3/36*
U.S. Cl. 179—170 R **8 Claims**

1. A bidirectional amplifier circuit arrangement for use in a bidirectional transmission line to prevent first signals travelling in a first direction from interfering with second signals travelling in a second direction, comprising:

means defining a pair of separate circuits through said bidirectional amplifier circuit;

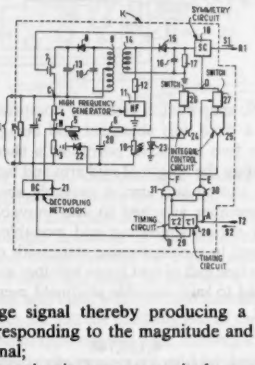
a pair of electronic hybrid circuits positioned at the juncture between the ends of said pair of separate circuits and the mutually adjacent ends of said transmission line, each of said electronic hybrid circuits having a first input terminal connected to one of said ends of said transmission line, a second input terminal connected to one of said ends of one of said separate circuits and an output terminal connected to one of said ends of the other of said separate circuits, said electronic hybrid circuits further including:

(a) reference voltage generating means having an input connected in circuit with said first input terminal for

continuously producing a first voltage signal at the output thereof in response to the impedance characteristic of said one of said transmission lines connected to said first input terminal, said reference voltage generator means including a variable resistor network for reproducing the capacitive and the resistive characteristics of said one of said transmission lines;

(b) signal producing means connected in circuit with said first input terminal and said input to said reference voltage generating means for producing a second voltage signal in response to said second signal from the other of said transmission lines connected in circuit with said second input terminal;

(c) means operatively connected to said variable resistor network of said reference voltage generating means for superposing a control of the magnitude and phase of said



first voltage signal thereby producing a third voltage signal corresponding to the magnitude and phase of said second signal;

(d) comparator circuit means operatively connected to said output from said reference voltage generating means and said first input terminal for comparing said second and third voltage signals thereat and effecting the production of a fourth voltage signal in response thereto; and

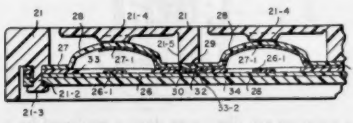
(e) means operatively connected to said comparator circuit means and being responsive to said fourth voltage signal for controlling said superposing means for effecting a cancelling of said second signal thereby preventing it from reaching said output terminal while simultaneously transmitting said second signal to said one of said ends of said transmission line and remaining ready to receive said first signals from said one of said ends of said transmission lines and passing them through to said output terminal.

4,128,744

KEYBOARD WITH CONCAVE AND CONVEX DOMES

Richard E. Seeger, Topsfield, Mass., assignor to Chomerics, Inc., Woburn, Mass.

Filed Feb. 22, 1977, Ser. No. 771,016
Int. Cl.[2] H01H *13/70*
U.S. Cl. 200—5 A **8 Claims**



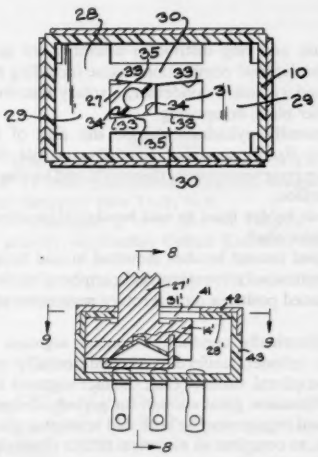
1. A keyboard comprising a first sheet of flexible and resilient insulator plastic, a first circuit pattern supported on the underside of said sheet, said first circuit pattern having contactors and circuit lines of electrically conductive material, said circuit lines selectively coupled to said contactors, a first plurality of snappable convex domes and at least one concave dome formed in said first sheet, each dome supporting a contactor of said first circuit pattern, an insulator spacer having a plurality of openings in register with said concave and convex domes and of a size to selectively permit the domes to extend into said openings, a second sheet of insulator plastic supporting a second circuit pattern, said second circuit pattern having contacts and circuit lines of electrically conductive material, said circuit lines selectively coupled to said contacts in register with said openings, and means for continuously holding said first sheet, spacer and second sheet together whereby said concave dome extends into said spacer opening in register therewith and said contactor supported thereby is urged against a contact of said second circuit pattern in register therewith, said first circuit pattern contactors supported by said convex domes capable of being snapped into said spacer openings to selectively engage other contacts of said second circuit pattern by depression of said convex domes, said contactors of said first circuit pattern being supported on the interior of said convex domes and on the exterior of said at least one concave dome, and at least the contactor supported by said at least one concave dome being interconnected by a circuit line to a contactor supported by at least one of said convex domes.

4,128,745

SLIDE SWITCH WITH SNAP-ACTION DETENT MEANS

Dominic O. Marsilio, Flourtown, and Edwin J. O'Bryan, Philadelphia, both of Pa., assignors to Continental-Wirt Electronics Corporation, Warminster, Pa.

Filed Jan. 4, 1977, Ser. No. 756,689
Int. Cl.[2] H01H *15/18, 9/00*
U.S. Cl. 200—16 C **11 Claims**



1. A multi-position electrical slide switch comprising an enclosed switch assembly which includes a rectilinearly slidable insulated contact carrier mounting at least one elongated electrical contact movable therewith and a relatively fixed insulating support mounting a plurality of relatively fixed contact terminals spaced along the path of travel of each movable contact in underlying relation thereto, said movable contact being adapted to electrically bridge at least two adjacent ones of said spaced contact terminals upon shifting movement of said contact into one or another selected position, and a relatively stationary longitudinally slotted detent plate disposed above the top surface of said slidable contact carrier in a plane paralleling the path of travel of said movable contact, said contact carrier including an upstanding part having oppositely projecting V-shaped side walls which project upwardly through said slotted detent plate and said detent plate being

provided with a pair of laterally spaced longitudinally extending flexible members which extend along the full length and define therebetween the slot of said detent plate, said flexible members being operatively engageable with opposite sides of said upwardly projecting part of said contact carrier and adapted to be temporarily sidewise oppositely biased by said part when said contact carrier is shifted out of any one of its said selected positions whereby said flexible members upon said temporary biasing thereof under sidewise pressure of said upwardly projecting part of said contact carrier establishes a releasable force for automatically effecting snap action movement of said slidable contact carrier into and retention thereof in said selected position.

4,128,746

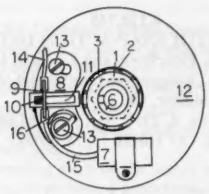
BRUSH AND RING DISTRIBUTOR

Donald W. Felder, 837 Hillside Dr., Sherman, Tex. 75090

Filed Apr. 1, 1977, Ser. No. 783,694

Int. Cl.[2] H01H *19/00*; F02P *1/00*

U.S. Cl. 200—24 **3 Claims**



1. A brush and ring distributor assembly for an ignition circuit for an internal combustion engine including a primary coil, a secondary coil, a condenser, a rotary distributor shaft and a breaker plate, comprising:

(a) a generally cylindrical-shaped slip ring of insulative material fixedly mounted coaxially on said distributor shaft for rotary movement therewith, and having a peripheral surface,

(b) a brush holder fixed to said breaker plate adjacent said distributor shaft,

(c) first and second brushes mounted in said brush holder and continuously engaging said peripheral surface at axially spaced positions during rotary movement of said slip ring,

(d) an electrically conductive contact segment for each engine cylinder, uniformly circumferentially spaced on said peripheral surface, each contact segment having an axial dimension great enough for periodical simultaneous electrical engagement by both said brushes as said slip ring rotates, to complete an electrical circuit through said first and second brushes,

(e) a set of axially spaced, electrically conductive, breaker segments for each engine cylinder, uniformly circumferentially spaced on said peripheral surface, each set being located between adjacent pairs of contact segments, and each breaker segment being electrically insulated from every contact segment and every other breaker segment,

(f) the spacing between each pair of breaker segments in each set being such that when said first brush contacts only one of said pair, said second brush contacts only the other of said pair, to open the electrical circuit between said first and second brushes,

(g) said contact segments and said breaker segments being electrically insulated from said distributor shaft,

(h) means in said brush holder electrically connecting said first brush to the primary coil in said ignition circuit,

(i) means in said brush holder electrically grounding said second brush.

4,128,747

HINGE FOR A PIVOTABLE ARM OF AN ELECTRIC SNAP SWITCH

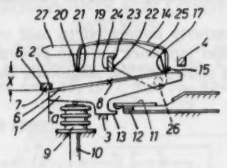
Tage S. Basse, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 17, 1976, Ser. No. 715,149

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536554

Int. Cl.[2] H01H *21/44*

U.S. Cl. 200—67 D **3 Claims**



1. An electric snap switch assembly comprising, a stiff arm pivotal about a fixed axis abutment and being movable in a range between two operative positions, a sheet metal hinge member extending the length of said arm and being attached to said abutment and to said arm, a movable abutment, a sheet metal spacer member attached to said movable abutment, a U-shaped bow spring straddling said movable abutment and being maintained in a compressive state with one leg thereof attached to the free end of said hinge member and the other leg thereof attached to said movable abutment member.

4,128,748

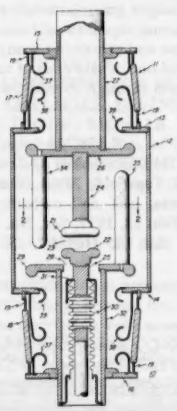
HIGH-CURRENT VACUUM SWITCH WITH REDUCED CONTACT EROSION

James M. Lafferty, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 707,297, Jul. 21, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 867,986

Int. Cl.[2] H01H *33/66*

U.S. Cl. 200—144 B **10 Claims**



1. In a vacuum arc discharge device enclosed by a hermetically sealed, evacuated envelope containing a pair of longitudinally-disposed, relatively-movable unshielded contacts capable of controllably opening and closing, both contacts being exposed to high electric field intensity when separated from each other, and a pair of interdigitated, noncontacting sets of stationary auxiliary electrodes disposed about the longitudinal axis of the device for carrying the arc when the contacts are parted, each of said contacts, when parted, being separated

from said auxiliary electrodes entirely by vacuum, the improvement wherein each of said contacts is faced with a refractory metal and each of said auxiliary electrodes comprises an easily-vaporizable metal.

4,128,749

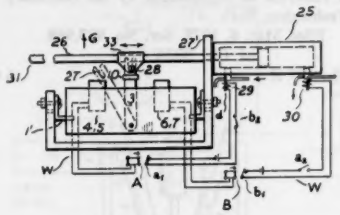
LATCHING SWITCH

Conan H. Spaderna, 39 Biltmore St., Springfield, Mass. 01115

Filed Sep. 7, 1976, Ser. No. 721,179

Int. Cl.[2] H01H *1/50*

U.S. Cl. 200—254 **10 Claims**



1. A latching switch, comprising a housing of insulating material; a trough shaped inside the housing; a lever, insulating the operator from an electrical source, and plying in the trough with a small builtin deviation of the lever run against the trough way, and being pivoted by a pin, seated across the middle of the trough and near its bottom; a flying contact, designed to close and open a circuit and fastened to the lever between the pivot pin and the handling end of the lever; at least one pair of terminal type contact lugs, forming a wedge holder across the run of the flying contact, and latching the lever by an elastic bias.

4,128,750

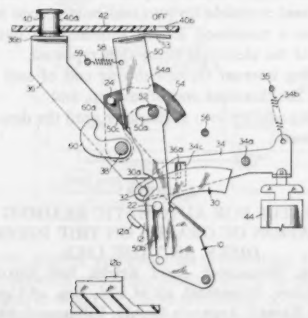
CIRCUIT BREAKER CLOSURE CONTROL AND CONDITION INDICATOR APPARATUS

Roger N. Castonguay, Terryville; Charles L. Jencks, Avon, and Robert C. Turton, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,269

Int. Cl.[2] H01H *9/00, 3/00*

U.S. Cl. 200—308 **10 Claims**



1. In a circuit breaker having a spring powered operating mechanism for translating movable contacts between open and closed circuit positions with respect to stationary contacts, apparatus for controlling the closure of the movable contacts and for indicating the various circuit breaker conditions, said apparatus comprising in combination:

A. latching means releaseably latching the movable contacts in their open circuit position against the force of charged mechanism springs acting to bias the movable contacts toward their closed circuit position;

B. release means selectively operable on said latch means to effect unlatching of the movable contacts, thereby enabling the charged mechanism springs to drive the movable contacts to their closed circuit position; and

C. breaker condition indicating means including

(1) an indicator arm mounted for movement between first, second and third positions, said arm being directly coupled with the movable contacts,

(2) a display panel mounted by said arm, said panel bearing plural distinct breaker condition indicia for separate registry with a viewing window depending in the position of said arm,

(3) a spring biasing said arm to its first position while the movable contacts are in their open circuit position and the operating mechanism springs are discharged, and

(4) an actuator coupled with the breaker operating mechanism for movement from a discharged position to a charged position incident with articulation of the operating mechanism pursuant to the charging of the mechanism springs, in moving from said discharged to said charged positions, said actuator engaging and shifting said arm from its first to its second position,

(5) upon unlatching of said latching means by said release means to precipitate translation of said movable contacts to their closed circuit position, said arm being controllably shifted from its second position to its third position by the closing movement of said movable contacts.

4,128,751

MICROWAVE HEATING OF FOODS

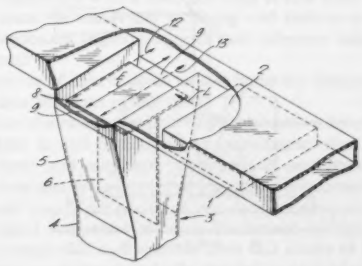
Anthony J. H. Sale, Sharnbrook, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 6, 1977, Ser. No. 785,274

Claims priority, application United Kingdom, Apr. 8, 1976, 14374/76

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 A **16 Claims**

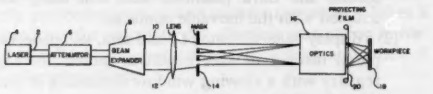


1. An apparatus for heating frozen food packs for consumption, said apparatus comprising a microwave energy source, a microwave energy outlet, energy feed means for feeding microwave energy from said source to said outlet, and conveying means for conveying a pack containing frozen food past said outlet, the movement of said conveying means being in a direction at right angles to the direction of propagation from said microwave energy outlet and also at right angles to the plane of polarisation of the Electric Field propagation.

4,128,752
LASER MICROMACHINING APPARATUS

Joseph A. M. Gravel, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Dec. 15, 1976, Ser. No. 750,898
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 L **10 Claims**

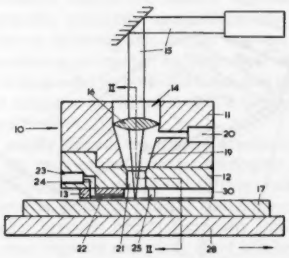


1. Laser micromachining apparatus capable of producing a particular machining pattern on a workpiece comprising:
- a laser device for producing a laser beam;
- a beam expander unit positioned to receive said laser beam and transform it into a beam of larger and substantially uniform cross-sectional area;
- a mask device in the path of said laser beam after said beam expander unit, said mask device including a diffraction pattern corresponding to said particular machining pattern, said diffraction pattern including a plurality of different individual perforations;
- converging lens means for focusing said laser beam and positioned adjacent said mask device in the path of said beam; and
- image optics means in the path of said laser beam after said converging lens means and mask device for imaging the whole of said diffraction pattern of said mask onto said workpiece, said converging lens means being a spherical lens superposing said diffraction pattern of said different individual perforations of said mask at the entrance pupil of said image optics means to provide a minimum size imaging unit for reproducing said diffraction pattern on said workpiece.

4,128,753
LASER BEAM WELDING

Charles M. Sharp, Nether Heyford, England, assignor to BOC Limited, London, England

Filed Jul. 29, 1977, Ser. No. 820,374
Claims priority, application United Kingdom, Aug. 3, 1976, 32283/76
Int. Cl.[2] B23K 9/02
U.S. Cl. 219—121 L **8 Claims**

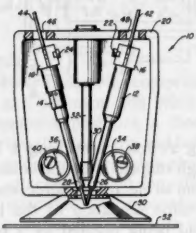


1. Laser welding apparatus comprising:
- a body including a first passage defining an optical path for a laser beam;
- means for directing a laser beam along said passage and for focussing such beam to a position outside the body closely adjacent to a terminal portion of said passage at which workpieces to be welded together are, in use, located;
- the body including a second passage having an outlet in said terminal portion of the first passage and which is adapted to direct a jet of shielding gas transversely of said first passage to impinge on plasma formed within said terminal portion during welding;
- and the wall of said terminal portion of the first passage having an aperture so disposed as to permit said jet to sweep plasma away from the welding zone through the aperture.

4,128,754
ARC SPRAY WELDING REPLACEABLE ELECTRODE TIP

Edwin H. Rathjen, Jr., Cambridge, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 6, 1978, Ser. No. 883,968
Int. Cl.[2] B23K 9/12
U.S. Cl. 219—137 R **6 Claims**



1. The method of replacing electrode tips which are subject to excessive heat and wear wherein said tips are integral with electrodes having base ends affixable within and to an arc spray gun and said electrodes including said base ends and said tips are one piece and have a communicating bore within which and through which metalizing wires pass and wherein there is a close sliding fit between said wires and said tips whereby the ends of said wires are positioned for abutting engagement at a fixed predetermined position to complete an electrical circuit for arcing and liquefying of said wire ends by the intense heat thus generated, and an air stream deposits said liquefied metal directly onto a surface to be thus plated, said method comprising the steps of:
- a. obtaining an available tip externally threaded on one end, said tip having a bore of desired diameter,
- b. determining and then fabricating an electrode holder of sufficient length whereby upon insertion of the threaded end of said available tip into said holder, said holder and tip have a combined length substantially equal to the length of the electrode being thus replaced,
- c. providing internal threads in one end of said holder to receive the threaded end of said tip, and
- d. threading said tip into said holder until the desired length is achieved.

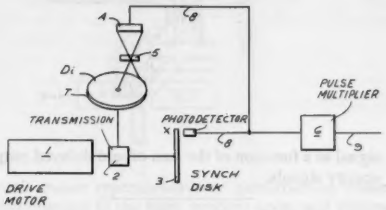
4,128,755
APPARATUS FOR AUTOMATIC READING AND EVALUATION OF GRAPHS ON TRIP RECORDER DISKS, AND THE LIKE

John Fairley, Brigachtal; Josef Krickl, Bad Dürrheim, and Robert Weber, Brigachtal, all of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,181
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602461
Int. Cl.[2] G06F 7/00; G06K 9/00; G05B 1/00
U.S. Cl. 235—92 T **11 Claims**

1. An apparatus for reading and evaluating the diagrams on a diagram carrier bearing a plurality of graphs of different respective formats in different respective tracks, comprising, in

combination, a scanning station including a plurality of scanning elements arranged in a row; drive means for moving the diagram carrier in the direction of the tracks thereon and perpendicular to the row of scanning elements; reading means operative repeatedly for reading the individual scanning elements of the row in succession, including programming and registering means operative for subdividing the row of scanning elements into sectors corresponding to respective tracks, operative during one reading of the row for distinguishing between the first graph-line-activated element in each sector and subsequent activated elements in the same sector and for



determining for each sector the total number of activated elements in the sector, and operative during one reading of the row for registering for each sector the location-number of the first activated element in the sector and the total number of activated elements in the sector; tabulating means; and means operative upon the completion of the reading of the row for transferring from the programming and registering means to the tabulating means the registered information representing the location-numbers of the first activated element in each sector and the total number of activated elements in each sector.

4,128,756

COUNT CONTROL APPARATUS

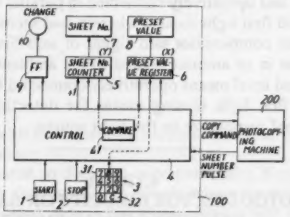
Akira Nagano, Nagaokakyo; Kazuaki Urasaki, Muko; Akira Osato, Mishima, and Isao Sakurai, Tokyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto and Konishiroku Photo Industry Co., Ltd., Tokyo, both of, Japan

Filed May 26, 1977, Ser. No. 800,714

Claims priority, application Japan, May 31, 1976, 51-63814

Int. Cl.[2] G06M *3/02;* **G06B** *27/06*

U.S. Cl. 235—92 SB **29 Claims**



1. A count control apparatus for controlling a processing unit, said processing unit being constructed to be enabled by an enabling signal to effect repetitive processing operations and to generate a count signal for each processing operation, said apparatus comprising counting means operatively coupled to said processing unit for counting the number of said count signals generated by said processing unit, means for presetting a desired number of processing operations to be carried out by said processing unit on a digit by digit basis, decision means operatively coupled to said counting means and said presetting means for judging whether the count value in said counting means is in a predetermined relationship with said preset numerical value, means responsive to said decision means for providing an enabling signal to said processing unit, said enabling signal being conditioned by the output of said decision means, manually operable means operatively coupled to said enabling signal providing means for making said enabling signal providing means non-responsive to said decision means, and means responsive to said manually operable means for causing said enabling signal providing means to generate a differently conditioned enabling signal, whereby said processing unit is normally enabled by said enabling signal generated by said enabling signal providing means as conditioned by the output of said decision means for performing the processing operations, but is differently enabled by said differently conditioned enabling signal generated by said enabling signal providing means, and whereby said preset number of processing operations may be changed without interrupting a current sequence of processing operations of the processing unit.

4,128,757

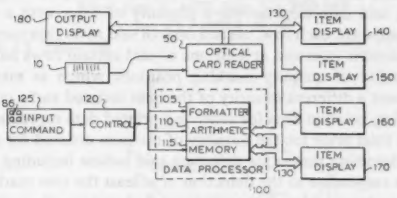
CUSTOMER INITIATED ORDERING SYSTEM

Dudley E. Garner, Jr., 971 SW. Meadowbrook, Palm Bay, Fla. 32905

Filed May 5, 1977, Ser. No. 794,009

Int. Cl.[2] G06K *15/18, 7/10;* **G06F** *7/38*

U.S. Cl. 235—383 **13 Claims**



1. A customer initiated system for ordering selected quantities of a plurality of customer selected items, said system comprising in combination:

an opaque card of predetermined size including therein a two dimensional data matrix of punch-out blanks for being removed by the customer from the card to form data apertures therein representative of the items and quantities to be ordered, with said data matrix oriented in known registration with a reference edge of said card;

a frame for removably receiving said card so as to be in stationary registration with said reference edge of said card;

a source of light coupled to said frame for illuminating said data apertures of said card;

a two dimensional matrix of photosensitive detectors coupled to and in known stationary registration with said frame and said card, with each of said photosensitive detectors being located adjacent to a corresponding one of said punch-out blanks of said card for generating a data signal responsive to being illuminated by light passing through said data aperture from said source of light;

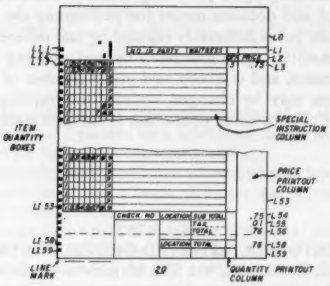
computer means electrically coupled to each of said photosensitive detectors for sequentially scanning said matrix and receiving said data signals therefrom and responsive thereto generating order signals representative of the items and quantities ordered; and

a plurality of visual displays electrically coupled to, but each remotely spaced from, said computer means for visually displaying selected ones of said order signals, whereby individual items comprising the order may be separately assembled and collected from the remote preparation locations to fill the customer's order.

4,128,758
ELECTRONIC ORDER PRICING SYSTEM

Raymond J. Bukowski, Chicago, and Frederick S. Erst, Arlington Hts., both of Ill., assignors to Motiograph, Inc., Richardson, Tex.

Continuation of Ser. No. 14,605, Feb. 26, 1970. This application Oct. 16, 1972, Ser. No. 297,819
Int. Cl.[2] G06K *1/12*
U.S. Cl. 235—433 61 Claims



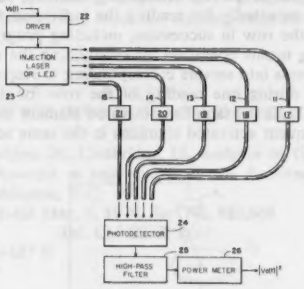
1. In an electronic order pricing system, the improvement comprising a data card having indicia representative of orderable items and the quantity of each item ordered for a given order, said data card having a plurality of rows with a row mark adjacent each row, certain ones of said rows representing an orderable item and at least one of said certain rows having a plurality of quantity marking positions which as marked represent a different quantity of the item ordered and a corresponding printout area for receiving printed data representing a row total price for the quantity of the item ordered for such row, detecting means for detecting said indicia including first means responsive to the detection of at least the row mark for said row to provide a first output signal identifying the ordered item and a second means responsive to the detection of a mark in one of the quantity positions of said one row to provide a second output signal indicating the quantity of the identified item ordered, processing means responsive to said first and second output signals to effect the calculation of a row total price representing the cost for the quantity of each item ordered and an item total price representing the sum of the row total prices, and printout means controlled by said processing means to effect the printout in the corresponding printout areas of said data card of the row total prices calculated.

4,128,759
FIBER OPTIC DELAY LINE FILTER

Barry R. Hunt; George M. Dillard, and Henry F. Taylor, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1977, Ser. No. 853,157
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 14 Claims

1. A fiber optic delay line filter comprising:
transducer means for converting temporally varying input signals to commensurate light energy signals;
a plurality of fiber optic light paths arranged to receive and transmit said light energy signals,
said fiber optic light paths having determinably variant optical propagation delays; and
a photo detection means disposed to receive the delayed output light energy signals of all said plurality of fiber optic light paths for producing a single electrical output

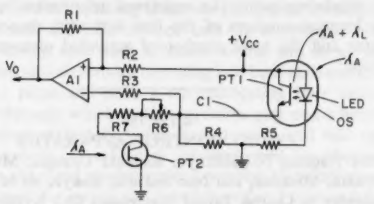


signal as a function of the sum of said delayed output light energy signals.

4,128,760
AMBIENT LIGHT COMPENSATING CIRCUIT

James R. Del Signore, II, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 7, 1977, Ser. No. 785,720
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—214 B 12 Claims



1. An ambient light compensating circuit, comprising:
(a) a first light sensing means having an output on which is provided a signal responsive in part to a light source and in part to ambient light;
(b) a second light sensing means responsive only to ambient light and operatively connected in parallel with the output of said first light means, wherein said second light sensing means compensates said signal of said first light sensing means in an amount related to the ambient light; and
(c) signal level means operatively connected to the output of said first light sensing means for detecting that portion thereof responsive to the light source.

4,128,761
PHOTODETECTOR CIRCUIT FOR BALLISTIC VELOCITY MEASUREMENT

Kenneth L. Oehler, Box 840, 501 Noton St., Pflugerville, Tex. 78660

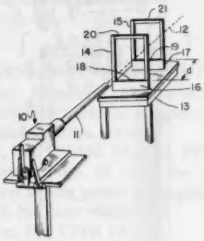
Filed Oct. 7, 1977, Ser. No. 840,254
Int. Cl.[2] G01D *21/04*
U.S. Cl. 250—222 R 5 Claims

1. An apparatus for measuring a ballistic characteristic of a projectile traveling along a predetermined path comprising
first and second photoresponsive circuit means having photosensitive portions for producing electrical signals substantially linearly representative of the level of light incident upon said photosensitive portions over a predetermined range;
log circuit means connected to said first and second photoresponsive circuit means for producing signals proportional

to the logarithms of said electrical signals representative of light level;

an amplifier having an input and an output;

capacitive circuit means connected between said log circuit means and said input to said amplifier for coupling AC signal components of the signals produced by said log



circuit means representative of perturbations caused by rapid changes in the light incident upon said photosensitive portion to said amplifier and for blocking DC components thereof; and

means responsive to the output of said amplifier for measuring the interval of time elapsed between successive signals representing said rapid changes.

4,128,762

APPARATUS FOR MEASURING MECHANICAL STRESS USING WHITE X-RAYS

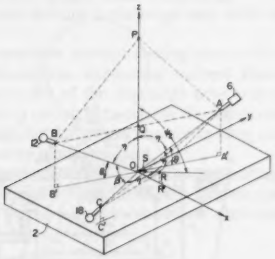
Masato Nagao, and Sho Kusumoto, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 6, 1977, Ser. No. 813,299

Claims priority, application Japan, Sep. 8, 1976, 51-106723

Int. Cl.[2] G01N *23/20*

U.S. Cl. 250—272 **9 Claims**



1. An apparatus for measuring mechanical stress, using white X-rays, comprising

an X-ray source so disposed as to cast white X-rays upon a position in the surface of a sample where the stress is to be measured, said X-rays travelling along a first plane containing a normal to said position and obliquely crossing with a second plane which includes said normal and which extends in the direction in which the stress is measured, said X-rays impinging upon said position at an angle η with said normal;

a first X-ray detector so disposed as to receive the X-rays diffracted from said position at said angle η with said normal, said diffracted X-rays travelling along said first plane;

a second X-ray detector so disposed as to receive the X-rays diffracted from said position at said angle η with a line existing in said second plane, making an angle ψ_2 with said normal, making the angle η with the path of said white X-rays from said X-ray source and passing through said position in the sample surface, said diffracted X-rays travelling along a third plane containing said line and said path; and

a multi-channel pulse height analyzer for analyzing the X-ray signals detected by said first and second X-ray detectors, wherein said stress σ_x is obtained according to the following formula

$$\sigma_x = K \frac{E_{n2} - E_{n1}}{\sin^2 \psi_2},$$

where E_{n1} and E_{n2} are the energies of X-rays detected respectively by said first and second X-ray detectors and K is a constant such that

$$K = -\frac{E}{1+\nu} \frac{1}{\bar{E}_n},$$

where E is the Young's modulus, ν the Poisson's ratio, and $\bar{E}_n$ the energy of diffracted X-rays in the case where is no strain in said sample and where the Bragg angle is complementary to said angle η.

4,128,763

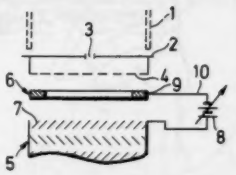
ENERGY ANALYZER FOR CHARGED PARTICLES

Hans-Dietrich Polaschegg, Bornheim, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 802,962

Int. Cl.[2] H01J *39/00*

U.S. Cl. 250—305 **7 Claims**



1. Apparatus for analyzing the energies of charged particles, comprising: analyzer means for generating an electric or magnetic field through which the particles pass, said analyzer means having an outlet aperture through which the charged particles exit as a beam; a detector arranged in the path of the beam leaving the analyzer field through said outlet aperture; and electrode means provided between said analyzer means and said detector and being connected to a variable voltage source for adjusting the cross section of the particle beam, thereby to allow the size of the particle beam cross section to be adapted to the size of the sample without changing the optimally adjusted sensitivity of the apparatus.

4,128,764

COLLECTIVE FIELD ACCELERATOR

John S. Luce, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

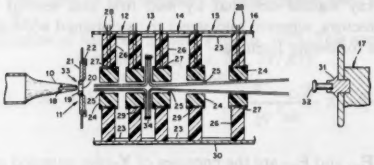
Filed Aug. 17, 1977, Ser. No. 825,504

Int. Cl.[2] H01J *37/00*

U.S. Cl. 250—398 **8 Claims**

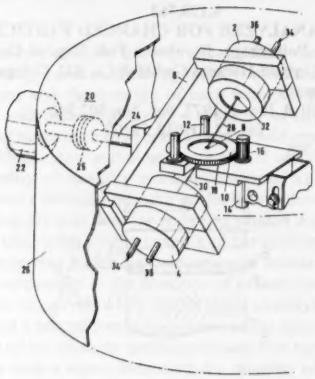
1. A collective field accelerator in combination with a vacuum diode adapted to operate with a relativistic electron beam with a ν/γ of $\sim$ 1; said vacuum diode comprising a tapered, grooved cathode and an insulated anode assembly having a central hole therein; said collective field accelerator comprising a plurality of spaced focusing lens assemblies having means for producing an axial magnetic field thereabout for focusing plasma vortex filaments made of collectively accelerated elec-

trons and ions which are ejected from said anode assembly onto an associated target; said cathode, anode assembly and



focusing lens assemblies being located on a longitudinally extending axis.

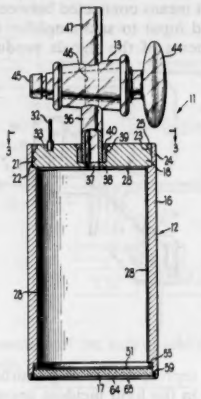
4,128,765
ION BEAM MACHINING TECHNIQUES AND APPARATUS
Joseph Franks, 26 Hamilton Rd., London, England
Filed Oct. 29, 1976, Ser. No. 736,954
Int. Cl.[2] G21K *5/06*
U.S. Cl. 250—442 **20 Claims**



1. A method of ion beam machining for the preparation of specimens to be examined by electron microscopy techniques comprising directing at least one ion beam from an ion source onto a specimen while effecting relative rotation between the ion source and the specimen and simultaneously varying the angle of incidence of said at least one ion beam on said specimen with such angle varying in a random manner with respect to said relative rotation of said ion squrce and said specimen.

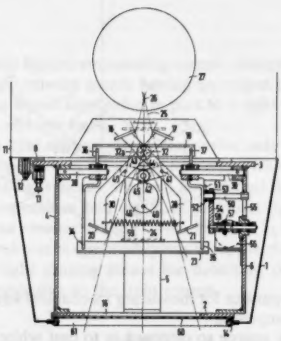
4,128,766
STRENGTHENED SCINTILLATION CELL
William M. Stevens, Loveland, Ohio, assignor to Randam Electronics, Inc., Cincinnati, Ohio
Filed Jun. 13, 1977, Ser. No. 805,629
Int. Cl.[2] G01J *1/58*
U.S. Cl. 250—483 **29 Claims**

1. A scintillation cell comprising:
(A) a gas tight container including:
(1) a tube of metal having cylindrical symmetry and open ends;
(2) a substantially transparent gas-impermeable first section of material rigidly adhered to one end of said tube in a gas-tight relationship; and
(3) a gas-impermeable second section of material rigidly adhered to the other end of said tube in a gas-tight relationship;
(B) inlet means in fluid communication with the interior of said container for introducing and retaining a gas inside said container; and



(C) a luminescent material coated on said tube and said second section of material on the inside of said container.

4,128,767
X-RAY PRIMARY RADIATION DIAPHRAGM ASSEMBLY
Lars Stödberg, Stenhamra, and Hans Sjöström, Spanga, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed May 6, 1977, Ser. No. 794,406
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2633059
Int. Cl.[2] A61B *6/06*
U.S. Cl. 250—513 **3 Claims**



1. A primary x-ray diaphragm assembly comprising two pairs of diaphragm plates, staggered 90°, for mounting in operative relation to an x-ray tube in a relatively close-to-focus position, and further comprising two pairs of diaphragm plates, likewise staggered 90°, for mounting in a relatively remote-from-focus position, the plates of each pair of diaphragm plates being commonly adjustable symmetrically to the longitudinal axis of the diaphragm assembly such that, in the mounted state, the diaphragmed pyramid configuration defined thereby has its vertex lying substantially at the focus of the x-ray tube, characterized in that each close-to-focus diaphragm plate and a complementary remote-from-focus diaphragm plate oppositely disposed with reference to the diaphragm longitudinal axis are secured to at least one lever, respectively, which is pivotably mounted about an axis lying between such diaphragm plates, said axis being common to four diaphragm plates, with the

levers pivotal on a common axis being capable of being pivoted in a scissors-like fashion, and with the length of the lever arms being selected to correspond to the desired position of the vertex of the pyramid configuration defined by said diaphragm plates, and characterized in that, on two levers, connected in scissors-like fashion, two arms are provided for each lever axis, said arms being symmetrically linked to said levers and being interconnected in an articulated fashion.

4,128,768

OZONE GENERATING APPARATUS

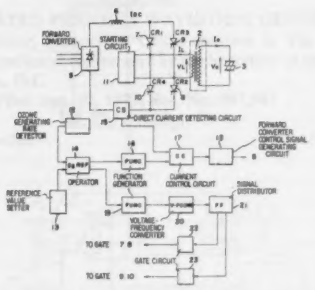
Yoshihiko Yamamoto; Masahiro Shigenobu, and Hideo Kuwabara, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 577,455, May 14, 1975, Pat. No. 4,051,045. This application Jul. 19, 1977, Ser. No. 817,097

The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclosed.

Int. Cl.[2] C01B *13/11*

U.S. Cl. 250—535 **1 Claim**



1. An ozone generating apparatus comprising:

an ozone generator having a discharge tube with discharge electrodes,

a rectangular waveform current feeding device for feeding rectangular waveform alternating current through the discharge electrodes of the discharge tube without a capacitive coupling circuit between the discharge electrodes and the rectangular waveform current feeding device for driving the ozone generator, and

control means for controlling the ozone generating rate of the ozone generator by controlling the current and/or the frequency of the rectangular waveform alternating current.

4,128,769

EDUCTOR MUFFLER

Robert Bons, Scottsdale, and Sam S. Kitaguchi, Phoenix, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 27, 1976, Ser. No. 727,209

Int. Cl.[2] F01D *15/10;* **H02K** *7/18;* **G10K** *11/00*

U.S. Cl. 290—52 **14 Claims**

4. A turbine-generator unit comprising:

a housing having first, second, and third chambers and an opening between said second and third chambers;

means for admitting a flow of cooling air into said second chamber;

an exhaust port for exhausting heated gases from said third chamber;

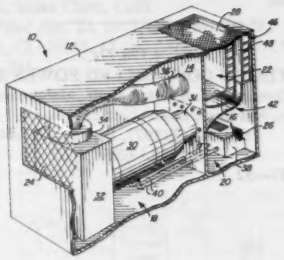
an electric generator mounted in said first chamber;

a gas turbine engine mounted in said first chamber in driving relationship with said generator;

an oil cooler in said second chamber for carrying oil from said turbine engine in heat exchange relationship with said flow of cooling air passing into said second chamber;

muffler means in said third chamber communicating with said opening and said exhaust port; and

an exhaust duct in said second chamber for receiving flow of exhaust gases from said turbine engine and carrying the



latter towards said opening, said duct being spaced from said opening whereby flow of exhaust gases from said duct through said opening to said muffler draws in a flow of cooling ambient air from said second chamber to intermix with said exhaust gases in said muffler.

4,128,770

AUTOMATICALLY RETURNING APPARATUS FOR TURN SIGNAL LAMP SWITCH

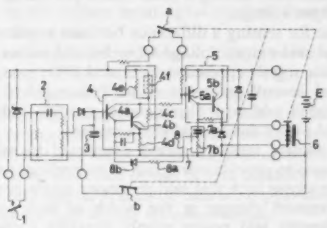
Kunio Okazaki, Hatano, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1976, Ser. No. 728,172

Claims priority, application Japan, Jan. 29, 1976, 51/008818

Int. Cl.[2] H02G *3/00*

U.S. Cl. 307—10 LS **10 Claims**



1. An automatically returning apparatus in combination with a turn signal lamp switch of a wheeled vehicle, comprising:

a turn signal lamp switch (a,b) which includes at least a first switch (a),

contact means (1) coupled to said turn signal lamp switch and to at least one wheel of the vehicle for opening and closing corresponding to the rotation of the wheels of the vehicle after throwing of said turn signal lamp switch and for generating a plurality of intermittent signals responsive to said wheel rotation,

detecting means (2, 4) coupled to said contact means (1) for detecting said intermittent signals, said detecting means including switching means (4) for conducting current responsive to detection of a predetermined number of said intermittent signals,

a solenoid (6) coupled to said turn signal lamp switch for returning said turn signal lamp switch to its non-operating position,

driving circuit means (5) coupled to said switching means (4) and to said solenoid (6) and responsive to the conducting current of said switching means (4) for energizing said solenoid (6) for return of said turn signal lamp switch to its non-operating position, and

circuit means (7, 8) coupled to at least one of (i) said switch-

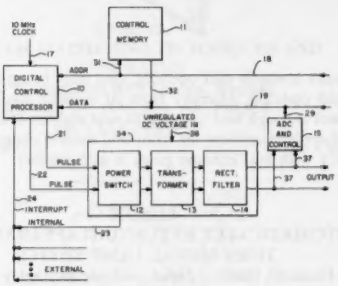
ing means (4) and (ii) said driving circuit means (5), said circuit means including means for maintaining the energization of said solenoid (6) for a given period of time after initial energization of said solenoid (6) to insure that said turn signal lamp switch fully returns to its non-operating position.

4,128,771

DIGITALLY CONTROLLED POWER SYSTEM

Robert J. Domenico, Los Gatos, Calif., assignor to Palyn Associates, Inc., San Jose, Calif.

Filed Jan. 7, 1977, Ser. No. 757,468
Int. Cl.[2] G05F *1/02*
U.S. Cl. 307—52 **27 Claims**



1. A digitally controlled power system controlled during timed clock cycles comprising:

at least one power supply responsive to a pair of control pulses each having a pulse width providing a controlled output voltage,

means for sensing a difference between a reference voltage and said output voltage whereby said means provides an error signal representative of said difference,

digital control processor means connected to receive and process said error signal and to provide said pair of control pulses during said clock cycles,

and control memory means connected to said processor means to provide a program of instructions to said processor means such that said processor means provides a programmed change in the width of said control pulses whereby said power supply provides a change in said output voltage.

4,128,772

GENERATION OF TUNABLE FAR-INFRARED RADIATION

Tao-Yuan Chang, Lincroft; Theodoor C. Damen, Colts Neck, and Van-Tran Nguyen, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1977, Ser. No. 865,434
Int. Cl.[2] H03F *7/00*
U.S. Cl. 307—88.3 **5 Claims**

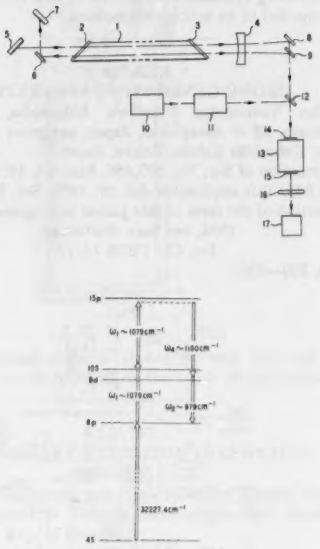
1. An apparatus for generating infrared radiation comprising:

a conversion vessel having infrared transmitting entrance and exit windows for containing a conversion medium;

said conversion medium including atoms having a ground state, a predetermined first excited state and a plurality of excited states higher in energy than said first excited state;

means for exciting a portion of said atoms of said conversion medium from said ground state to said first excited state at a predetermined time;

means for generating at least two beams of infrared photons of at least two predetermined energies such that two of said photons combine to a first energy value close to the energy value associated with a predetermined two-photon transition between said first excited state and one of said plurality of excited states; and such that the photons of one of said beams of photons are substantially equal in energy to the difference between said first energy value and a predetermined output energy, and



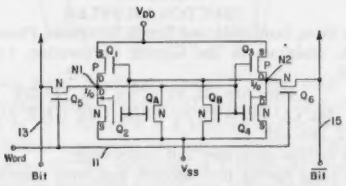
means for directing said beams of photons through said conversion medium in such a manner that said beams of photons overlap spatially and temperally in said conversion medium and have a predetermined temporal relationship to said predetermined time, whereby said two beams of infrared radiation interact in said conversion medium to generate an output beam of infrared radiation.

4,128,773

VOLATILE/NON-VOLATILE LOGIC LATCH CIRCUIT

Bruce L. Troutman, Irvine, and Lawrence S. Schmitz, Costa Mesa, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 7, 1977, Ser. No. 848,854
Int. Cl.[2] G11C *11/40*
U.S. Cl. 307—238 **6 Claims**



1. In combination with an integrated semiconductor memory latch circuit having:

(a) a pair of branches, each branch including an IGFET load and an IGFET driver connected in series drain-to-drain at a node, the control gate of the IGFET driver of each branch being connected to the node of the other branch, said IGFET drivers having electrically variable thresholds;

(b) means for normally maintaining a first voltage across said pair of branches which is below that required to change the threshold of said IGFET drivers;

(c) means for turning on a selected one of said IGFET drivers so as to store information in said latch circuit in volatile form; and

(d) means for temporarily raising the voltage across said pair of branches to a second, higher level which is sufficient to cause opposite long term threshold shifts in said IGFET drivers, said drivers being subject to being permanently cut off as a result of said voltage being raised beyond said second level;

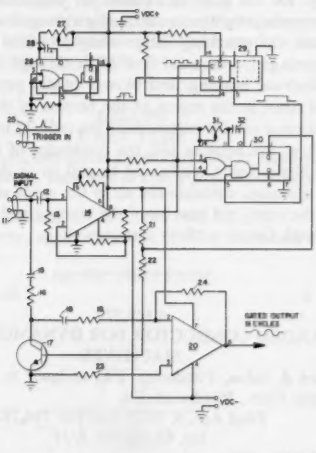
the improvement comprising a pair of fixed threshold shunt IGFETs, each connected so as to bypass a respective one of said driver IGFETs having an electrically variable threshold, so that, when one of said drivers is cut off, the shunt IGFET which bypasses it will continue to carry sufficient current to replace that normally conducted by the cut off driver.

4,128,774

N CYCLE GATED PERIODIC WAVEFORM GENERATOR

Clifford O. Shaw, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1977, Ser. No. 807,947
Int. Cl.[2] H03K *3/78*
U.S. Cl. 307—260 **13 Claims**



1. A periodic waveform generator for accurately producing a predetermined number of complete cycles of a cyclic waveform comprising:

a source of cyclic electrical energy having a desired waveform;

detector means connected to said source of cyclic electrical energy for producing an output corresponding to the cyclic electrical energy attaining a predetermined value on each cycle thereof;

switch means connected to said source of cyclic electrical energy and effectively connected to said detector means for selecting one of two current paths;

a first path where said cyclic electrical energy is shunted to ground;

a second path for passing a predetermined number of cycles of said cyclic electrical energy having said desired waveform and timing the passed cyclic electrical energy from the time that the predetermined value was attained;

a source of trigger signals; and

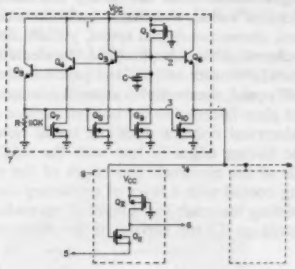
a control circuit connected to said source of trigger signals and effectively connected to said switch means for initiating the selection of one of said two paths.

4,128,775

VOLTAGE TRANSLATOR FOR INTERFACING TTL AND CMOS CIRCUITS

Thomas M. Frederiksen, San Jose, and James B. Cecil, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 22, 1977, Ser. No. 808,752
Int. Cl.[2] H03K *17/60, 1/02, 1/14, 19/08*
U.S. Cl. 307—264 **28 Claims**



1. An interface circuit especially useful for coupling a TTL circuit output to a CMOS circuit input comprising, in combination,

current regulation and bias voltage generating means for regulating current and generating a bias voltage source,

voltage translation means cooperatively connected to said bias voltage source of said current regulation and bias voltage generating means for translating any voltage input received from a TTL circuit output to a voltage level that is suitable for driving a CMOS circuit and that corresponds to the voltage input signal received from the TTL circuit output, and

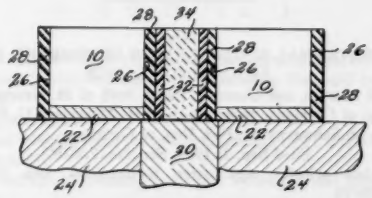
said current regulation and bias voltage generating means comprising bipolar transistor means having a plurality of transistors electrically connected together at each base thereof for regulating current and providing a bias voltage output at a certain level, and MOS transistor means having a plurality of MOS transistors each of which is connected to an electrode of one of said plurality of transistors of said bipolar transistor means for providing a current sink for said bipolar transistor means.

4,128,776

MAGNETOHYDRODYNAMIC ELECTRODE

Carl W. Boquist, Chicago, and David D. Marchant, Naperville, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1976, Ser. No. 745,942
Int. Cl.[2] H02N *4/02*
U.S. Cl. 310—11 **9 Claims**



1. A composite electrode for use in a magnetohydrodynamic generator comprising:

a refractory ceramic matrix containing 10 to 50 volume

percent of a continuous metal reinforcement which is an electrically conductive nonferromagnetic, oxidation-resistant metal or alloy melting above 1000° C., the metal being selected from the group consisting of niobium, hafnium, tantalum, molybdenum, and alloys of niobium-zirconium, hafnium-tantalum, nickel-chromium and nickel-molybdenum, the form of the reinforcement being selected from the group consisting of a sintered fiber mat, an open-pore foamed metal and a three-dimensional woven wire fabric, and the refractory ceramic matrix being selected from the group consisting of stabilized zirconium oxide, stabilized hafnium oxide, iron-doped spinel, chromium-doped spinel, yttrium oxide and strontium-doped lanthanum chromite: the electrode having a top surface, a bottom surface and parallel side walls; an electrically and thermally conductive intermediate attachment plate fastened to the bottom surface of the electrode in electrical contact with the metal reinforcement, the plate having edges in line with the side walls; the side walls of the electrode and edges of the atachment plate being coated with a layer of refractory ceramic electrical insulating material; and a layer of unreinforced refractory ceramic on the top surface of the electrode.

4,128,777

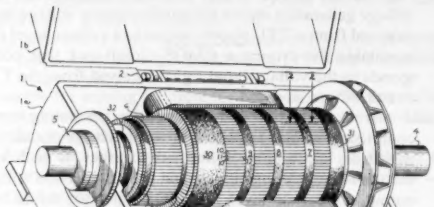
ARMATURE CORE WRAPPED WITH IRRADIATION CURABLE GLASS BANDING

Martin A. Zgraggen, Erie, Pa., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,357

Int. Cl.[2] B32B *7/00, 17/02;* **H02K** *15/12*

U.S. Cl. 310—45 **11 Claims**



1. In a dynamoelectric machine having a rotatable core having slots with energizing windings disposed therein the improvement comprising banding said slots with an irradiation curable glass band comprising at least one multi-layer glass core banding tape positioned around the core to exert a radially compressive force thereon, and an irradiation cured epoxy or polyester resin impregnated in each layer of the tape to a substantially uniform thickness in the range of about 0.5 mils to about 2 mils between adjacent layers of the band.

4,128,778

EXTERNAL-ROTOR MOTOR SUPPORTED BY MOUNTING FLANGE

Alfred Merkle, and Georg F. Papst, both of St. Georgen, Fed. Rep. of Germany, assignors to Papst-Motoren KG, St. Georgen im Schwarzwald, Fed. Rep. of Germany

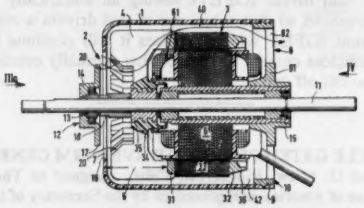
Filed Sep. 2, 1976, Ser. No. 720,082

Claims priority, application Switzerland, Sep. 8, 1975, 011559/75

Int. Cl.[2] H02K *9/06*

U.S. Cl. 310—67 R **18 Claims**

1. An external rotor motor of protectively insulated and internally cooled design, comprising, in combination, an internal stator; a generally bell-shaped external rotor surrounding the stator, the generally bell-shaped rotor having a bottom constituting one axial end of the bell-shaped rotor; a rotor shaft connected to and rotating with the rotor; a mounting flange located at the other of the two axial ends of the rotor; a bridge fixedly connected with the mounting flange, the bridge being in the form of a protective insulating cylindrical housing connected at one axial end to the mounting flange and extending axially over the whole axial length of the rotor and being circumferentially complete to protect the rotor from physical contact by external objects, at least the exterior of the housing being made of electrically insulating material, the end of the cylindrical housing remote from the end connected to the mounting flange extending radially inward at said one axial end



of the rotor with axial spacing from said one axial end of the rotor and having at such remote end a plurality of air inflow openings for the flow of external air therethrough, the air inflow openings being symmetrically arranged relative to the rotor axis, the mounting flange being provided with air outflow openings for the axial flow of air through the interior of the cylindrical housing; and blower blades provided on the external rotor in the region of the bottom of the bell-shaped external rotor axially intermediate the radially inward extending part of the housing and the remainder of the rotor, the blower blades being configured to pull air in through the air inflow openings, circulate the air in the space about the exterior of the rotor and interior of the housing and discharge the air through the air outflow openings.

4,128,779

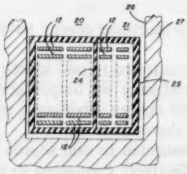
STRANDED CONDUCTOR FOR DYNAMOELECTRIC MACHINES

Sheppard J. Salon, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 5, 1977, Ser. No. 784,753

Int. Cl.[2] H02K *3/14*

U.S. Cl. 310—213 **3 Claims**

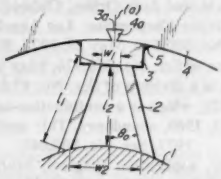


1. A winding conductor for a dynamoelectric machine, said conductor comprising two bars disposed physically and electrically in parallel, each of said bars consisting of a plurality of insulated strands disposed in two side-by-side stacks and transposed between stacks, said bars being subject to unequal division of current between them during operation of the machine, and the cross-sectional areas of the two bars being different such that the current density is substantially the same in both bars.

4,128,780
ROTOR HAVING IMPROVED ARM STRUCTURE TO REDUCE TENSILE STRESSES

Tadasi Sonobe, Iwaki, Japan, assignor to Hitachi, Ltd., Japan

Filed Sep. 22, 1976, Ser. No. 725,630
Claims priority, application Japan, Sep. 25, 1975, 50-114667
Int. Cl.² H02K *1/22*
U.S. Cl. 310—265 **19 Claims**

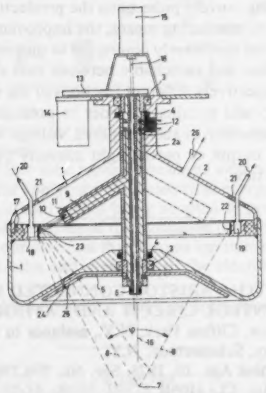


1. A rotor for use with rotary electric machinery, comprising:
- a rotary shaft;
- a plurality of sets of arms extending from said rotary shaft, said each set consisting of at least two arms;
- a rotor core having a plurality of silicon steel plates laminated in a predetermined thickness around the arms and welded to the outer ends of said arms;
- said each arm having a greater length in section transverse to the axis of the rotary shaft than a minimum length in the radial direction of the rotary shaft; and
- at least a portion of each arm extending in a non-parallel direction with a radial line extending from the rotary shaft along the minimum length.

4,128,781
X-RAY TUBE

Peter Flisikowski, and Horst Peemöller, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,652
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607618
Int. Cl.² H01J *35/04*
U.S. Cl. 313—60 **2 Claims**

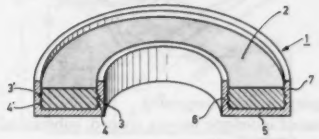


1. An x-ray source comprising an envelope, an annular anode having an inner surface arranged in said envelope, a shaft mounted in said envelope for rotation about an axis coaxial with the axis of said anode, a cathode supported on said shaft for movement therewith along a circular path about said axis of rotation, said cathode being arranged to emit a beam of electrons onto the inner surface of said annular anode to produce a beam of X-ray radiation directed towards said axis of rotation so that upon movement of said cathode along said path, said X-ray beam traverses a generally conical path with the apex thereof lying along said axis of rotation, and means for rotating said shaft.

4,128,782
GETTER HOLDER AND ELECTRIC DISCHARGE TUBE COMPRISING SUCH A HOLDER

Jan J. B. Fransen, and Franciscus J. Rimmelzwaan, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 613,854, Sep. 16, 1975, abandoned. This application May 19, 1977, Ser. No. 798,318
Claims priority, application Netherlands, Sep. 26, 1974, 7412693
Int. Cl.² H01J *61/26*
U.S. Cl. 313—174 **6 Claims**

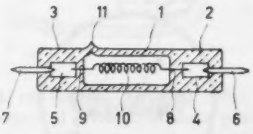


1. A getter device comprising a metal holder comprising sidewall and bottom portions shaped to form at least one open cavity having a mainly U-shaped cross-section and compressed vaporative gettering material disposed in said cavity; and shallow indentations extending peripherally into surface areas of said sidewall portions facing inwardly of said cavity, said indentations comprising means to interlock with and hold said gettering material in said cavity during flashing of said gettering material, the depth of said indentations being substantially less than the thickness of said sidewall portions, and outwardly facing surface areas of the same sidewall portions being free from outward projections complementary to said indentations.

4,128,783
TUNGSTEN/BROMINE CYCLE LAMP

Henricus F. J. I. Giller, and Germain R. T'Jampens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,424
Claims priority, application Netherlands, May 10, 1976, 7604953
Int. Cl.² H01J *61/12, 61/26*
U.S. Cl. 313—174 **3 Claims**



1. A tungsten/bromine cycle lamp having a transparent lamp vessel and further including the following disposed in said envelope:
- a tungsten filament;
- a getter selected from the group consisting of Ti, Zr, Nb, Ta, V and Hf;
- a gas mixture containing inert gas, hydrogen and bromine; and
- a compound of the formula Me $NH_xBr_yC_z$ or decomposition products thereof, in which formula z has the value 0, Me is selected from the group consisting of vanadium, niobium, and tantalum, $x = 1$, 2 or 3 and $y = x + 1$, or Me

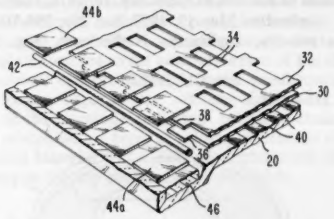
is selected from the group consisting of titanium, zirconium, and hafnium, and $x = 1$ or 2 and $y = x + 1$.

4,128,784

BEAM GUIDE FOR DISPLAY DEVICE WITH BEAM INJECTION MEANS

Charles H. Anderson, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 22, 1977, Ser. No. 835,772
Int. Cl.[2] H01J *29/08*
U.S. Cl. 313—422 **10 Claims**



1. A display device comprising

an evacuated envelope having spaced, substantially parallel front and back walls,

an electron beam guide extending along said back wall for confining electrons in a beam as the beam flows along a path substantially parallel to said front wall and for selectively deflecting the beam toward a phosphor screen along said front wall at selected points along the beam path,

gun means at one end of the beam guide for generating electrons and directing the electrons as a beam toward the beam guide, and

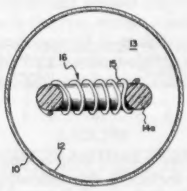
projecting means on said beam guide at said one end of the beam guide for creating an electrostatic field which causes the electron beam to leave the gun means and enter the beam guide along said path.

4,128,785

CORE CONFIGURATION FOR INDUCTION IONIZED LAMPS

Armand P. Ferro, Schenectady, N.Y., and Loren H. Walker, Salem, Va., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 789,514, Apr. 21, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,208
Int. Cl.[2] H01J *7/44, 13/46, 17/34, 19/78*
U.S. Cl. 315—57 **12 Claims**



1. In an induction ionized, solenoidal electric field lamp of the type comprising a mass of an ionizable gas and transformer means, including a closed loop magnetic core linking said gas, which function to induce a high frequency electric current flow in said gas; the improvement wherein:

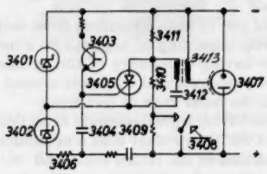
said magnetic core is of a substantially toroidal shape, defining a central tunnel opening, the generatrix of said core having reduced thickness, as measured along the direction parallel to the axis of said toroidal core, in regions adjacent said tunnel opening.

4,128,786

CONTROL OF ELECTRONICALLY GENERATED LIGHT PULSES

Zoltan Vital, Uccle, and Jean Orban, Clabecq, both of Belgium, assignors to Vivitar Corporation, Los Angeles, Calif.

Division of Ser. No. 580,519, May 23, 1975, Pat. No. 4,049,996, which is a division of Ser. No. 358,974, May 10, 1973, Pat. No. 3,943,406, which is a division of Ser. No. 17,634, Mar. 9, 1970, Pat. No. 3,749,921, which is a continuation-in-part of Ser. No. 799,554, Feb. 13, 1969, abandoned. This application May 24, 1977, Ser. No. 800,041
Claims priority, application Belgium, Mar. 7, 1969, 71104; Jun. 27, 1969, 75962; Sep. 22, 1969, 79321
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—151 **1 Claim**



1. In a device for controlling the duration of the light pulses produced by a light flash tube arranged to selectively produce either a full light intensity output or a partial light intensity output in response to electrical pulses produced by the discharge of a supply capacitor and including means for measuring the light produced by the flash tube, and means for terminating the light being produced by the flash tube in response to an indication produced by the measuring means, the terminating means including a trigger capacitor connected to the supply capacitor to be preliminarily charged to a required voltage constituting a fraction of the voltage across the supply capacitor prior to discharge of the supply capacitor and to produce a flash terminating current pulse upon the production of such an indication by the measuring means, the improvement comprising switch means operatively connected to one terminal of said trigger capacitor and switchable between two states for supplying two respectively different fractions of the supply capacitor voltage to said terminal in order to preliminarily charge said trigger capacitor to such required voltage for either full light intensity output or partial light intensity output, respectively, of said tube.

4,128,787

DC POP WITH VARISTOR CONNECTED BETWEEN CONTROL CIRCUIT AND CATHODE

John E. Bigelow, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,735
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **5 Claims**

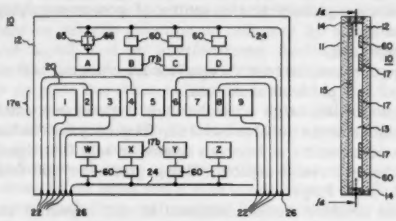
1. A gas discharge display comprising:

a first planar electrode structure;

a multiplicity of electrodes fabricated independent of one another in a plane substantially parallel to, and spaced from, said planar electrode structure;

a gas filling the volume between said planar electrode structure and said plurality of electrodes;

a conductive lead to be coupld to a plurality of the multiplicity of electrodes; and



a non-linear electrical resistance element in electrical series connection between each of said plurality of electrodes and said conductive lead.

4,128,788

METHOD AND APPARATUS FOR OPERATING A GASEOUS DISCHARGE LAMP WITH IMPROVED EFFICIENCY

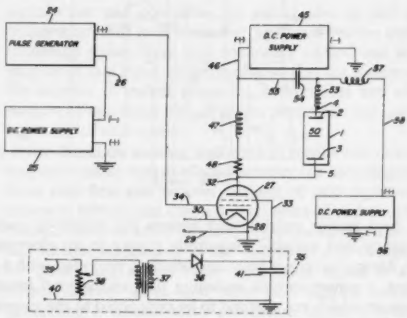
Frank E. Lowther, Buffalo, N.Y., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 594,790, Jul. 10, 1975, Pat. No. 4,009,416. This application Feb. 22, 1977, Ser. No. 771,045

The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.

Int. Cl.[2] H05B *41/16, 41/30*

U.S. Cl. 315—176 **10 Claims**



1. An apparatus for producing light from electrical energy which comprises:

(a) A gas filled tube having discharge electrodes:

(b) means for applying pulsed electrical energy between said electrodes, said means being adapted to provide pulses at a potential in excess of the ionization potential of said tube, and of a duration less than the gas ion transit time between the electrodes and greater than the electron transit time; and

(c) means for eliminating gas ions from between the electrodes.

4,128,789

METHOD OF OPERATING GASEOUS DISCHARGE LAMPS

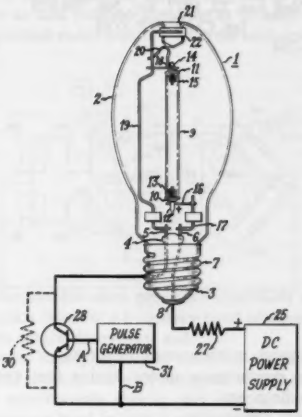
Daniel V. Owen, East Flat Rock, N.C., assignor to General Electric Company, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,333

Int. Cl.[2] H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R **8 Claims**

1. A method of operating a high pressure sodium vapor gaseous discharge lamp having a filling comprising a mixture of sodium vapor and at least another metal vapor within an elongated envelope provided with spaced electrodes, wherein during DC operation of the lamp said sodium vapor becomes ionized and the sodium ions migrate toward one of said electrodes away from the other metal vapor, which method comprises energizing said gaseous discharge lamp by electrical pulses having a unidirectional current wave form with a sufficient time interval between pulses to permit said migrated sodium ions to re-diffuse with said other metal vapor, whereby separation of color in the lamp and efficacy loss in the lamp due to said migration are avoided.



4,128,790

CATHODE RAY TUBE FOR DISPLAYING COLORED PICTURES

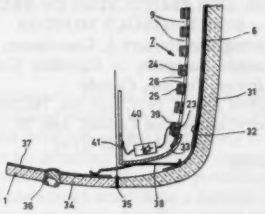
Martin H. G. Steeghs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,878

Claims priority, application Netherlands, Dec. 23, 1975, 7514975

Int. Cl.[2] H01J *29/58*

U.S. Cl. 315—382 **1 Claim**



1. A cathode ray tube for displaying colour pictures comprising in an evacuated envelope, means to generate a plurality of electron beams, a display screen having a large number of regions luminescing in different colours, colour selection means for assigning each electron beam to luminescent regions of one colour, said colour selection means including at least two electrodes at two different potentials for postfocusing the electron beams, and a voltage stabilizing rectifier having a cathode and an anode, the electrode of said colour selection means at the lower of said two different potentials being electrically connected to said anode of said rectifier and the electrode of said colour selection means at the higher potential and said cathode of said rectifier being electrically connected to a high voltage connection of the tube, said voltage stabilizing rectifier being mounted within said envelope in order to reduce

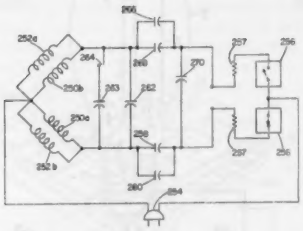
the total number of external connections for said electrodes to a single external connection.

4,128,791

PHASE SHIFT CIRCUIT FOR SYNCHRONOUS MOTOR

Jonathon H. Katz, 78 Cypress St., Brookline, Mass. 02146

Filed Apr. 22, 1977, Ser. No. 789,975
Int. Cl.[2] H02P *7/36*
U.S. Cl. 318—724 **5 Claims**



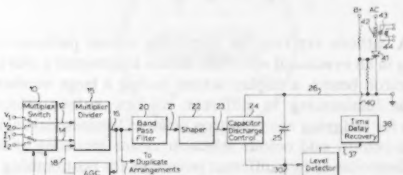
1. A synchronous motor system comprising
a two-phase synchronous motor having first and second phase windings, and
drive circuitry comprising
a voltage source,
one terminal of said source being effectively connected to one end of each of said first and second windings,
a first capacitance connected between the other terminal of said source and the other end of said first windings,
a second capacitance connected between said other terminal of said source and the other end of said second windings, and
a third capacitance connected between the junction of said first capacitance with said first windings and the junction of said second capacitance with said second windings,
said capacitance being selected to produce a desired phase relation and to minimize any amplitude difference in the voltage supplied to said first and second windings.

4,128,792

CONTROL AND PROTECTION OF BRUSHLESS SYNCHRONOUS MOTORS

Gordon W. Herzog, and Herbert A. Gaensbauer, both of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Apr. 7, 1977, Ser. No. 785,503
Claims priority, application Canada, Apr. 29, 1976, 251478
Int. Cl.[2] H02P *1/46*
U.S. Cl. 318—706 **11 Claims**



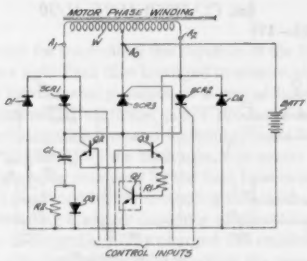
1. Apparatus for use in the starting of a three phase salient pole synchronous motor, said motor having means to accelerate the rotor thereof towards synchronous speed and field excitation means to be energized to provide field excitation when the rotor reaches a predetermined speed, comprising
power sensing means for deriving a first signal proportional to twice slip frequency, said power sensing means being connected only to the source of power supplying the motor,
a capacitor,
means connected to said capacitor for charging said capacitor at a predetermined rate,
capacitor discharge control means responsive to said first signal proportional to twice slip frequency for discharging said capacitor at intervals related to said first signal, the charge on said capacitor being greater at said intervals become longer,
lever detector means connected to said capacitor and responsive to the charge exceeding a predetermined level providing a second signal, and
field excitation control means responsive to said second signal for energizing said field excitation means.

4,128,793

POWER CIRCUIT FOR VARIABLE FREQUENCY, VARIABLE MAGNITUDE POWER CONDITIONING SYSTEM

Frederick A. Stich, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jul. 25, 1977, Ser. No. 818,986
Int. Cl.[2] H02P *5/40*
U.S. Cl. 318—808 **16 Claims**



1. In a power conditioning system for supplying variable frequency and variable magnitude power to an electromagnetic device having at least one winding provided with a center tap, a power circuit including first and second inverting thyristors which are adapted to be connected to the respective ends of said winding, said winding center tap being adapted to be connected to one polarity of a unidirectional source, a semiconductor chopper coupling said first and second inverting thyristors to the other polarity of said source, whereby said first and second inverting thyristors may be gated on alternately at a relatively low frequency to energize the respective halves of said winding in push-pull while said chopper is time ratio controlled at a higher carrier frequency to selectively vary the voltage applied to said winding, and a capacitor in shunt to said chopper, whereby said inverting thyristors may be commutated off by the charge on said capacitor when said chopper is off so they are not conducting load current.

4,128,794

INTERFEROMETRIC CORRECTION SYSTEM FOR A NUMERICALLY CONTROLLED MACHINE

Robert R. Burleson, Clinton, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 11, 1977, Ser. No. 841,087
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—603 **4 Claims**

1. In combination with a numerically controlled machine

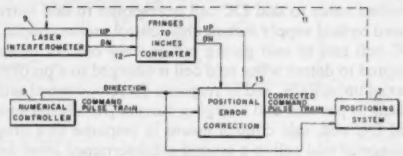
including a numerical controller for generating command pulses at an output and a direction control signal at a separate output and applying said command pulses to an input of a positioning system to position an article along an axis in a forward or reverse direction as indicated by said direction control signal, and an interferometer feedback system for monitoring the movement of said article and generating pulses on an up pulse line when movement is sensed in said forward direction and generating pulses on a down pulse line when movement is sensed in the reverse direction, a positioning error correction circuit comprising:

a bidirectional error counter having an up count input, a down count input and a zero count output which is activated each time said counter is counted down through zero count;

an error count limit selector means for selecting and registering an error count limit value corresponding to an absolute error limit magnitude;

a comparator means for comparing said error count registered by said counter with said error count limit value registered by said selector means and generating a correction signal at an output thereof when said error count exceeds said error count limit value;

input circuit means responsive to said direction control



signal from said controller for gating said up and down pulses from said interferometer feedback system and said command pulses from said controller to first and second outputs of said input circuit means so that the difference in the number of pulses appearing at said first and second outputs of said input circuit means represents the positioning error of said system;

an error direction sensing and control means responsive to said zero count output of said counter for directing pulses from said first and second outputs of said input circuit means to said up and down count inputs of said counter so that an absolute error count is registered by said counter and further responsive to the output of said comparator for generating a first error correction signal at a first output thereof when said error is a lagging error and generating a second error correction signal at a second output thereof when said error is a leading error;

an add-a-pulse circuit means responsive to said first error correction signal for adding command pulses to said input of said positioning system until said lagging error is less than said error limit; and

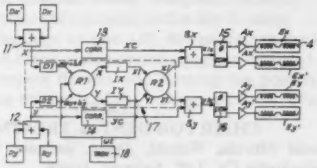
a delete-a-pulse circuit means responsive to said second error correction signal for deleting command pulses from the input of said positioning system until said leading error is less than said error limit.

4,128,795
DEVICE FOR DAMPING THE CRITICAL FREQUENCIES OF A ROTOR SUSPENDED BY A RADIAL ELECTROMAGNETIC BEARING

Helmut Habermann; Maurice Brunet, and Pierre Joly, all of Vernon, France, assignors to Societe Europeene de Propulsion, Puteaux, France

Filed Dec. 17, 1976, Ser. No. 751,968
Claims priority, application France, Dec. 24, 1975, 75 39760
Int. Cl.[2] G05B *5/01*
U.S. Cl. 318—618 **6 Claims**

1. A magnetic suspension system for suspending a rotor and comprising at least one electromagnetic radial bearing from which said rotor is suspended, said bearing including electromagnetic windings; detecting means for detecting the radial position of the rotor and for producing a position signal representative of said radial position of the rotor; energizing means for supplying a current to said windings; and a servo-circuit coupled between said detecting means and said energizing means for controlling the current supplied to said windings in response to said position signal so as to keep said rotor in a predetermined radial position, wherein said servo-circuit comprises:



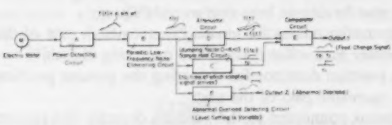
selective amplification means for selectively amplifying said position signal in a frequency band centered on a controllable central frequency; and

means for supplying to said selective amplification means a signal representative of the speed of rotation of the rotor for continuously slaving said central frequency of the frequency band in which said position signal is amplified to the rotational speed of the rotor, whereby critical frequencies of the rotor are damped by selective increase of the stiffness of the bearing.

4,128,796
GAP ELIMINATOR

Yasuji Ohashi, and Yoichiro Mitani, both of Osaka, Japan, assignors to NTN Toyo Bearing Company Limited, Osaka, Japan

Filed Mar. 29, 1976, Ser. No. 671,377
Claims priority, application Japan, Apr. 1, 1975, 50-40068
Int. Cl.[2] G05B *21/02*
U.S. Cl. 318—636 **2 Claims**



1. A gap eliminator for use in machine tools and the like having an associated electric motor, said gap eliminator comprising a power detecting circuit operatively connected to the electric motor for detecting the power or current of said motor under no-load or light conditions and producing a first output signal thereof under such conditions, a periodic low-frequency noise eliminating circuit electrically coupled with said power detecting circuit for converting an output signal $f(t) = a \cdot \sin\omega t$ from the power detecting circuit into an output signal $f(t)$, said noise eliminating circuit including band-pass filter circuits whereby a signal wave fed therein is put to the phase of $a \cdot \sin\omega t$, a level adjuster circuit for causing the signal wave fed from said band-pass filter circuits and to appear as $a \cdot \sin\omega t$ by adjusting its volume, a phase inverter circuit for inverting the phase of the signal wave fed from said level adjuster circuit so as to provide $-a \cdot \sin\omega t$, and an adder circuit for adding together the power and the signal wave $-a \cdot \sin\omega t$ which has fed from said phase inverter to provide the desired signal $f(t)$, a sample hold circuit electrically coupled to said noise eliminating circuit for receiving and storing the first output signal from the detecting circuit when the motor is under a no-load or light load condition, attenuator circuit means electrically coupled with said noise eliminating circuit in parallel with the sample hold circuit for producing a second output signal when said motor is under

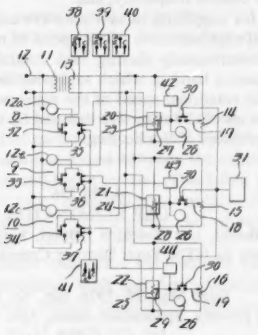
a loaded condition, and a comparator circuit for comparing said first and second output signals, said comparator circuit including means providing a deviation value as an output signal to control the feed rate of the machine tool.

4,128,797

CHAIR FOR DENTAL TREATMENT

Hiroshi Murata, Warabi, Japan, assignor to Daiko Iryoki Seisakusho Co., Ltd., Saitama, Japan

Filed Jul. 29, 1977, Ser. No. 820,119
Claims priority, application Japan, Jun. 11, 1976, 51/68502
Int. Cl.[2] G05B *1/06*
U.S. Cl. 318—666 **1 Claim**



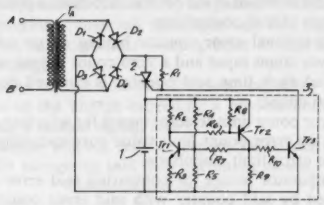
1. A chair for dental treatment comprising:
a seat having at least one movable part;
operating means for moving the movable part of the seat;
power means for driving the operating means;
a position detector for detecting the present position of the movable part of the seat;
means connected to the position detector for presetting the movable part of the seat to an optimum position;
a memory connected to the position detector for storing the optimum position of the movable part of the seat;
first actuatable control means for controlling the power means;
second actuatable control means for controlling the power means;
the power means including at least one motor coupled to said at least one movable part, normally open first switch means connected between the motor and the operating means and adapted to close when the first control means is activated, and second switch means connected across the first switch means between the motor and the operating means and adapted to close when the second control means is activated, said first and said second control means each having two operating modes by which the direction of rotation of said at least one motor is controlled, whereby it is correspondingly controlled by the direction of movement of said at least one movable part of said seat; and
means for reading the optimum position of the movable part of the seat from the memory and opening the second switch means when the present position matches the optimum position.

4,128,798

CHARGING CIRCUIT

Yoshihiro Takei, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 3, 1976, Ser. No. 682,239
Claims priority, application Japan, May 2, 1975, 50-60087[U]; May 2, 1975, 50-60088[U]; Dec. 10, 1975, 50-146980
Int. Cl.[2] H02J *7/04*
U.S. Cl. 320—23 **14 Claims**



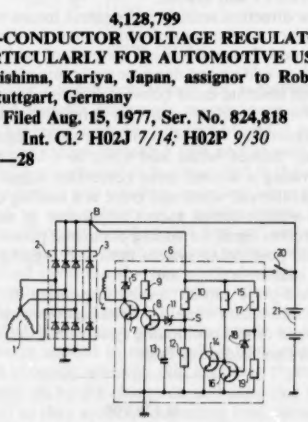
1. A charging circuit for charging a DC cell, comprising in combination supply means for producing a current, current gaing means disposed intermediate said DC cell and said supply means for selectively supplying a charging current of a first selected value to said DC cell in response to said current produced by said supply means, and control means coupled to said DC cell and to said gating means, said control means being adapted to detect when said cell is charged to a predetermined maximum voltage, and in response thereto, control said gating means to prevent said charging current from being supplied to said DC cell, said control means in response to a drop in the voltage of said cell to a second predetermined level defining a first closed current path means in parallel with said DC cell and controlling said gating means to permit said charging current to be applied to said DC cell and to said first closed current path means so that a charging current of a second value reduced with respect to said first value is supplied to said DC cell.

4,128,799

SEMI-CONDUCTOR VOLTAGE REGULATOR, PARTICULARLY FOR AUTOMOTIVE USE

Toshio Morishima, Kariya, Japan, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 15, 1977, Ser. No. 824,818
Int. Cl.[2] H02J *7/14;* H02P *9/30*
U.S. Cl. 322—28 **7 Claims**



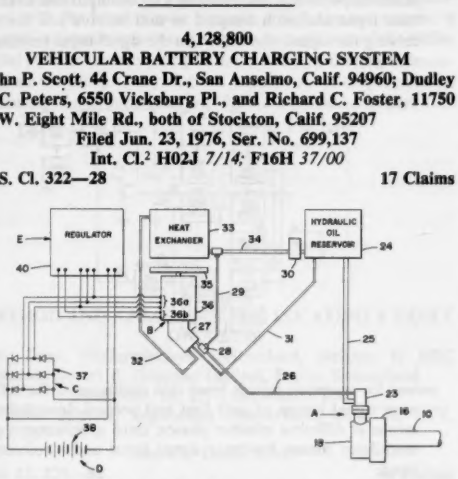
1. Semi-conductor voltage regulator for connection to a dynamo electric generator (1) and adapted to control current flow through the field winding (4) of the generator (1) as a function of the output voltage of the generator, comprising
a main semi-conductor controlled switch (7) having its output connected to controlled current flow through the field winding (4) of the dynamo electric generator (1);
a main voltage sensing means (10, 11, 12) including a main voltage divider (10, 12) connected to sense average output voltage of the dynamo electric generator and controlling conduction of said main semi-conductor switch (7);

an auxiliary voltage sensing means (17, 18, 19) connected to the output voltage of the dynamo electric generator (1) and sensing minimum instantaneous voltage levels thereof;
and an auxiliary semi-conductor controlled switch (14, 16) having its output connected to the main voltage divider (10, 12) and modifying the voltage division ratio thereof, said auxiliary semi-conductor controlled switch (13, 16) having its input controlled by said auxiliary sensing means.

4,128,800
VEHICULAR BATTERY CHARGING SYSTEM

John P. Scott, 44 Crane Dr., San Anselmo, Calif. 94960; Dudley C. Peters, 6550 Vicksburg Pl., and Richard C. Foster, 11750 W. Eight Mile Rd., both of Stockton, Calif. 95207

Filed Jun. 23, 1976, Ser. No. 699,137
Int. Cl.[2] H02J 7/14; F16H 37/00
U.S. Cl. 322—28 17 Claims



1. A vehicular battery charging system comprising a hydraulic pump, drive means rotationally coupling said hydraulic pump to a rotating axle of said vehicle, said drive means including a right angle gear drive disposed at one end of said axle and flexible coupling means for rotationally coupling the end of said axle and the input of said right angle gear drive, said hydraulic pump being coupled to the output of said right angle gear drive, a hydraulic motor disposed remote from said hydraulic pump and coupled to the output thereof, an alternator rotationally coupled to said hydraulic motor, and rectifier means for rectifying the a.c. output of said alternator, the output of the alternator from said rectifier means being coupled to said battery for charging.

15. A variable duty cycle free running multivibrator circuit comprising a first pair of transistors, a pair of capacitors, said first pair of transistors and said capacitors being connected in free running multivibrator configuration and second and third pairs of transistors respectively connected in complimentary Darlington differential configuration with the outputs thereof respectively connected to said capacitors to control the charging thereof, the differential inputs of said complimentary Darlington differential thereby controlling the duty cycle of said multivibrator.

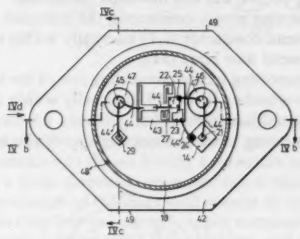
4,128,801
VOLTAGE REGULATOR STRUCTURE FOR AUTOMOTIVE-TYPE GENERATORS

Willi Gansert, Kornwestheim, and Norbert Rittmannsberger, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 7, 1977, Ser. No. 775,283
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610136
Int. Cl.[2] H02P 9/30; H01L 25/00
U.S. Cl. 322—28 19 Claims

1. Voltage regulator for combination with an automotive-type generator, said generating having two line output terminals and an exciter field terminal, the voltage regulator comprising

a free-wheeling diode (19);
a control circuit stage (13);
a power circuit stage (14);
said circuit stages including active semiconductor elements (15, 31) and passive electrical circuit elements (16, 32, 33, 34);
a housing (42, 48) having a metallic base (42) and a housing cap (48) secured to and sealed to the metallic base, covering and sealing said free-wheeling diode, and said circuit stages in one covered, sealed, composite element;
an insulating plate (43) secured within the housing;
two connecting lugs or pins (45, 46) passing through the housing and being sealed therethrough in insulated relation with respect thereto, and forming the positive and negative line terminals of the voltage regulator, connect-



able to the line terminals of the generator, the housing forming the field terminal of the voltage regulator and being connectable to the exciter field terminal of the generator, said housing, base and cover forming a standard power transistor housing package assembly;
wherein the power circuit stage (12) comprises a first chip (14) forming an integrated circuit directly electrically and mechanically secured to the metallic base (42) of the housing of the regulator;
the control circuit portion (13) comprises a second semiconductor chip (22) forming an integrated circuit supported on the insulating plate (43);
and wherein the free-wheeling diode comprises a third semiconductor chip (29) on which the diode structure is grown, the third chip (29) being secured to the metallic base (42) of the housing of the regulator.

4,128,802
SOLID STATE VOLTAGE REGULATED AUTOMOTIVE-TYPE ELECTRICAL POWER SUPPLY SYSTEM

Willi Gansert, Kornwestheim; Dietrich Bergfried, Boblingen; Gert Heinrich, Ludwigsburg; Dietmar Schnepf, Esslingen; Harry Slansky, Muhlacker, Grossglattbach; Eberhard Pfluger, Leonberg, and Jean Dorkel, Reutlingen-Betzingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 7, 1977, Ser. No. 775,284
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610137
Int. Cl.[2] H02P 9/30; H01L 25/00
U.S. Cl. 322—28 10 Claims

1. Solid state regulated power supply system having
a shunt excited ac generator (10) subject to widely varying drive speeds, including a shunt field (14); comprising
a free-wheeling bypass diode (19) connected in parallel with the field (14);
a voltage regulator (R) connected to the output of the generator and further connected to intermittently control energization of the field (14) including a power semi-conductor (LT) in series with the field (14), a comparator and control stage (ST) connected to and comparing the output voltage of the alternator with a reference (35) and controlling conduction of the power semi-conductor (LT), a first

integrated circuit (IC) monolithic chip (**28**) on which the power semi-conductor (LT) is formed and a second IC monolithic chip (**36**) on which the comparator and control stage (ST) is formed,

a single, hermetically sealed housing (G, **51**, **52**) including a metal base plate (**51**) and a housing cover, or cap (**52**) sealed thereto;

a third IC monolithic chip (**50**) on which the freewheeling diode (**19**) is formed;

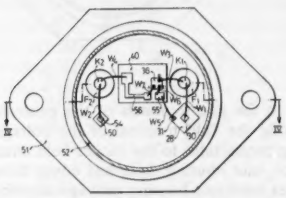
the first, second and third monolithic chips (**28**, **36**, **50**) being all located within the sealed housing (G; **51**, **52**) whereby the entire voltage regulator and the free-wheeling diode is included as a single electrically complete unit in a single sealed housing;

externally projecting terminal posts (K_1, K_2) sealed to the housing (G; **51**, **52**) and insulated therefrom;

first connecting means connecting the collector (**29**) of the power semi-conductor (LT) internally within the housing to the metal base plate (**51**);

second connecting means connecting one of the terminals of the free-wheeling diode (**29**) internally within the housing to the metal base plate (**51**);

third connecting means connecting one of the terminals of



the shunt field (**14**) to the metal base plate (**51**), whereby the metal base plate (**51**) of the housing (G; **51**, **52**) will form a common terminal (**53**) for the collector (**29**) of the power semi-conductor (LT), one terminal of the free-wheeling diode (**19**) and one terminal of the shunt field (**14**);

fourth connecting means (W_1) connecting the emitter of the power semi-conductor (LT) to one of the terminal posts (K_1);

fifth connecting means (W_2) connecting the other terminal of the free-wheeling diode to the other terminal post (K_2) for connection to the other terminal field (**14**);

internal connecting means (W_3–W_7) interconnecting the first and second monolithic chips and additionally interconnecting said second chip and said terminal posts; the first and third IC monolithic chips (**28**, **50**) being secured with one side thereof to the metal base plate (**51**) of the housing (G) in good electrical and heat conductive contact;

and an insulating plate (**40**) secured to the metal base plate (**51**), the second IC monolithic chip (**36**) being secured to the insulating plate to position the second IC monolithic chip within the housing in insulated relation with respect thereto.

4,128,803

METAL DETECTOR SYSTEM WITH GROUND EFFECT REJECTION

George C. Payne, Tempe, Ariz., assignor to PNI, Inc., Tempe, Ariz.

Filed Apr. 29, 1977, Ser. No. 790,385
Int. Cl.[2] G01V *3/10*; G01R *33/02*
U.S. Cl. 324—3 **10 Claims**

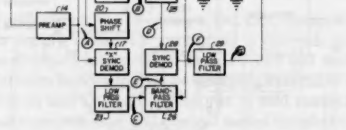
1. A system for detecting metallic objects and for distinguishing between objects of different types including in combination:

an oscillator;

a transmit coil coupled to said oscillator for transmitting signals generated by said oscillators;

a receive coil mounted in proximity to said transmit coil for receiving signals transmitted by said transmit coil, such received signals being modified in amplitude and phase when metallic objects are located in the path of the signals transmitted by said transmit coil;

first and second synchronous demodulator means for detecting "R" (eddy current) and "X" (reactive) signal components, respectively, each having a signal input and a reference input and each coupled to said receive coil for receiving the signals therefrom on the signal input terminals thereof;



means for coupling signals from said oscillator to the reference signal inputs of said first and second demodulator means at different relative phases; third synchronous demodulator means having a signal input and a reference input;

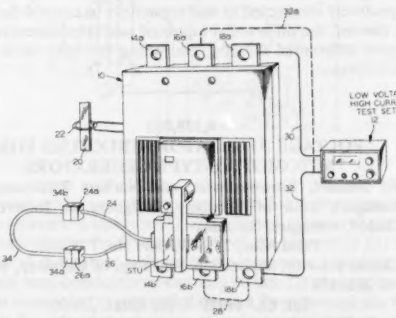
means coupling the outputs of said first and second demodulator means to the signal input and reference input respectively of said third synchronous demodulator means, the amplitude of the output signal from said third synchronous demodulator means being representative of the presence of a metallic object and the polarity of said output signal indicating the type of metallic object being detected; indicating circuit means coupled to the output of said third synchronous demodulator means.

4,128,804

GROUND FAULT DEFEAT CABLE FOR HIGH CURRENT STATIC TRIP CIRCUIT BREAKER TEST SETS

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jan. 19, 1978, Ser. No. 870,904
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—28 CB **5 Claims**



1. For use in conjunction with a multipole static trip circuit breaker having separate phase current sensing transformers feeding individual phase current monitoring signals to a static

trip unit respectively indicative of the currents flowing through each breaker pole, the static trip unit including a ground fault sensing differential current transformer having a plurality of primary winding, and a high current test set connected to pass test current of overcurrent proportions through a single breaker pole; a ground fault defeat cable electrically interconnected between said phase current sensing transformers and said static trip unit, said defeat cable including a plurality of conductors arranged to route the phase current monitoring signal developed by the phase current transformer associated with the breaker pole through which the test current is passed in opposite relative directions through two of the differential current transformer primary windings, thereby to maintain an overall primary current balance so as to prevent the initiation of a ground fault trip function by said trip unit.

4,128,805

METHOD AND APPARATUS FOR LOCATING A FAULT ON A LINE

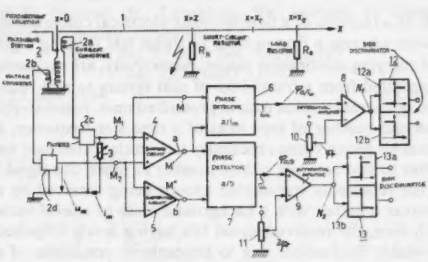
Otto Lanz, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Mar. 14, 1977, Ser. No. 777,527

Claims priority, application Switzerland, Mar. 25, 1976, 3717/76

Int. Cl.[2] G01R *31/08*

U.S. Cl. 324—52 **42 Claims**



35. An apparatus for determing a fault location on a line comprising, in combination:

a measuring station including a measurement location;

measuring means provided for the measuring station for measuring the line currents and line voltages appearing at the measuring location;

said measuring means including converter means for transforming the line currents and line voltages into signals corresponding to measurement currents and measurement voltages respectively;

said converter means including multiplier- or divider circuitry for weighting the current signals and voltage signals relative to one another;

an evaluation circuit connected to said converter means for the determination of the fault direction and fault distance;

said evaluation circuit including at least one phase detector delivering a phase angle signal which characterizes by its sign and magnitude the fault direction and the fault distance, respectively, in relation to a reference position on the line; and

said multiplier or divider circuitry being structured so as to add at least approximately no phase shift to said current signals and voltage signals to be weighted.

4,128,806

DEVICE FOR CHECKING THE INSULATION OF THE LEADS CONNECTING A GENERATOR TO A RECEIVER

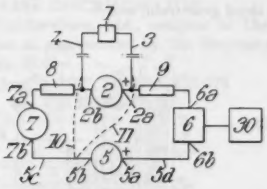
Gérard Lejeune, Fosses, and Jean-Claude Dubreucq, Paris, both of France, assignors to Inter-Elec, Drancy, France

Filed Jul. 26, 1977, Ser. No. 819,125

Claims priority, application France, Jul. 26, 1976, 76 22773

Int. Cl.[2] G01R *31/02, 31/12*

U.S. Cl. 324—54 **10 Claims**



1. A device for checking the insulation of first and second leads connecting the output terminals of a power generator to a receiver sensitive to signals having a set nature and an amplitude above a given threshold, characterized in that, in order to check the insulation of the leads with respect to an inteference generator having first and second output terminals and operative to transmit signals having the set nature, said device comprises:

current-detecting means having a first input terminal connected to said first lead and a second input terminal connected to said first output terminal of said interference generator, said current-detecting means being sensitive to a signal having a second nature different from the set nature, insensitive to the signals having the set nature, and operative to deliver a signal at a first level when the current between said first and second input terminals is above a threshold i_1 and a signal at a second level when the current is below the threshold i_1;

a checking generator for producing signals having the second nature, said checking generator having a first output terminal connected to said second lead and a second output terminal connected to said second output terminal of said interference generator;

a first impedance disposed in series with said current-detecting means between said first lead and said first output terminal of said interference generator; and

a second impedance disposed in series with said checking generator between said second lead and said second output terminal of said interference generator, the values of said first and second impedances being chosen so that the amplitude of the signals produced by said interference generator and reaching said receiver is below the threshold.

4,128,807

MULTI-DIAL ELECTRIC METER REGISTER

Kenneth G. Halstead, and Thomas G. Willis, both of Raleigh, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1977, Ser. No. 847,470

Int. Cl.[2] G01R *15/08, 11/64*

U.S. Cl. 324—116 **12 Claims**

1. A multi-dial electric utility meter register assembly comprising:

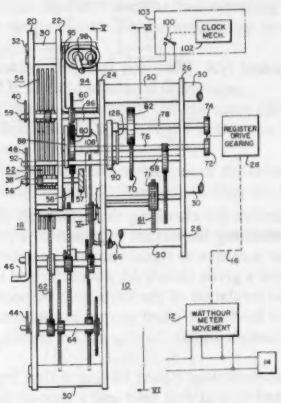
a frame for detachably mounting to a watthour meter movement;

first, second and third gear trains mounted in said frame, each of said first, second and third gear trains having a separate input gear, and each of the gear trains having a separate set of plural dial pointer shafts for indicating totalized values of electrical power usage;

a register drive gearing rotatable in response to measuring operation of said watthour meter movement;

a first shifting control plate carried by said frame for shiftable movement between first and second positions for effecting alternate coupling of said register drive gearing to input gears of said first and second gear trains;

a second shifting control plate carried by said frame for shiftable movement between first and second positions for effecting alternate coupling and uncoupling, respectively between said register drive gearing and said input gear of said third gear train; and



a connecting member extending between said first and second control plates and movable so that both of said first and second control plates are concurrently moved between the respective first and second positions thereof with an outer end of said connecting member providing a dial status indicator for visually indicating the activated dial pointer shafts of the gear trains being drivingly connected to said meter movement; and

an actuator means connected to one of said first and second control plates for moving the control plate connected thereto between said first and second positions thereof.

4,128,808

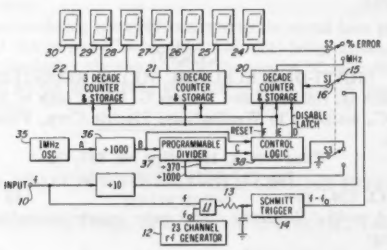
CHANNEL FREQUENCY ANALYSER

Marlin D. Westra, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.

Filed Nov. 4, 1976, Ser. No. 738,647

Int. Cl.² H03C 3/00

U.S. Cl. 325—134 **7 Claims**



1. A method of measuring the percentage deviations of any one of a plurality of first frequencies from a plurality of respective reference frequencies, comprising the steps of

counting during a period of predetermined duration the difference between the number of cycles of one of said first frequencies and the number of cycles of the corresponding one of said reference frequencies,

the duration of said period being selected such that said difference is mathematically related to each of said percentage deviations by substantially the same factor for all of said first frequencies and the corresponding ones of said reference frequencies.

4,128,809

TIME DIVERSITY RECEIVER FOR PROCESSING REPEATEDLY RECEIVED SIGNAL BITS IN CONSIDERATION OF A MAXIMUM-LEVEL AND/OR A FAVORABLY RECEIVED SIGNAL BIT

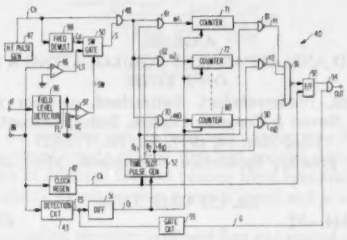
Kouzou Kage, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1977, Ser. No. 829,320

Claims priority, application Japan, Aug. 31, 1976, 51-104596; Aug. 31, 1976, 51-104597; Mar. 29, 1977, 52-35785; Jun. 9, 1977, 52-68604; Jun. 9, 1977, 52-68605

Int. Cl.² H04L 1/08

U.S. Cl. 325—324 **17 Claims**



1. In a receiver of a time diversity electrical communication system wherein a first number of signal bits forming a group and carrying information pieces, respectively, are successively transmitted from a transmitter of said system to said receiver through a transmission path in prescribed ones, respectively, of a second number of time slots of a time slot frequency, said signal bit group being repeatedly transmitted from said transmitter to said receiver a third number of times, the signal bits of the repeatedly transmitted groups being received by said receiver together with a background noise of a level variable with time, the received signal bits having levels subjected to inevitable fluctuations due to atmospheric conditions of said path and due to said noise, a combination which comprises:

first means for detecting the levels of the signal bits of said groups to produce first signals of levels representative of the detected signal bit levels;

dividing means for dividing said first signals into groups corresponding to the respective information pieces;

second means for introducing the idea of preference or weight into the levels of the first signals for each of said first signal groups to produce a second signal representative of the result of introduction of the preference or weight, said second means successively producing the second signals for the respective first signal groups; and

reproducing means responsive to said second signals for reproducing said information pieces.

4,128,810

SIGNAL LEVEL INDICATOR DRIVING CIRCUIT

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 24, 1976, Ser. No. 717,391

Claims priority, application Japan, Aug. 28, 1975, 50-103430

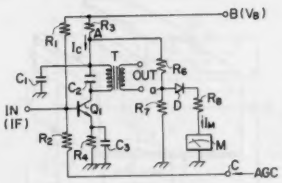
Int. Cl.² H04B 1/26

U.S. Cl. 325—398 **4 Claims**

1. A tuning indicator driving circuit for use in a radio re-

ceiver circuit including an automatic gain control circuit, comprising:

detector means for detecting a dc component of an output of the automatic gain control circuit, said detector means including a signal amplifying element in the receiver circuit generating an output signal containing said dc component and an ac component, said dc component being controlled by the output of the automatic gain control circuit, means for shunting said ac component of said amplifying element output to ground, and a dc current



path means connected to said amplifying element output for transmitting the dc component of said output, said dc current path means comprising means for determining a threshold voltage above which a current is allowed to flow therethrough, said voltage determining means including means for shifting the level of said dc component in said current path means and an element having a threshold voltage connected to said level shifting means; and

a tuning indicator means driven by the output of said threshold voltage determining means.

4,128,811

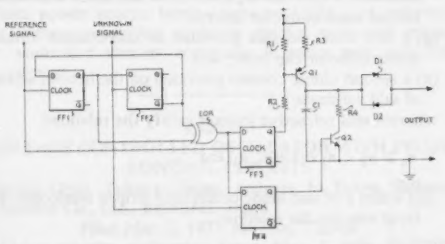
FREQUENCY INDICATING CIRCUIT

Arvid E. Englund, Jr., Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Jul. 5, 1977, Ser. No. 812,919

Int. Cl.[2] H03D *13/00*

U.S. Cl. 328—134 **8 Claims**



1. A circuit for indicating the relative frequency of first and second repeating signals, the frequencies of said first and second signals being respectively indicated by first and second repeating pulses, said circuit comprising:

a. first input means for said first pulses;

b. second input means for said second pulses;

c. third means having an exclusive OR device, said third means being connected to said first and second input means for producing at an output a binary signal which switches to a first value in response to receipt of each of said first pulses and which switches to a second value in response to receipt of each of said second pulses;

d. and fourth means having first and second outputs and having inputs, said fourth means inputs being connected to said third means output and to said first and second input means for producing a first value binary signal at said first output in response to said second frequency being equal to or greater than said first frequency; for producing a second value binary signal at said second output in response to said first frequency being equal to or greater than said second frequency; for producing a second value binary signal at said first output in response to said first frequency being greater than said second frequency; and for producing a first value binary signal at said second output in response to said second frequency being greater than said first frequency.

4,128,812

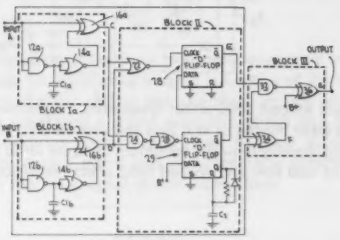
PHASE DISCRIMINATOR

James D. Pavlis, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 9, 1977, Ser. No. 823,078

Int. Cl.[2] H03D *13/00*

U.S. Cl. 328—134 **13 Claims**



1. A phase detector for detecting phase synchronism between a first reference input signal and a second input signal comprising:

a pulse generator which generates pulses at each transition of the first and second input signals, said pulse generator comprising pulse delaying circuits each which receives the input signals, and first gating means which is coupled to receive the input signals and the outputs from the pulse delaying circuits for producing a high logical output whenever the logical levels of its inputs are not in concert;

means coupled to the pulse generator for producing an output determinative of whether the pulses generated occur concurrently; and

gating means which compare the first and second input signals to the output of the means for determining concurrence for producing an output indicative of phase relationship, whereby the phase relationship is determined.

4,128,813

AMPLIFIER

Tadao Suzuki, and Tadao Yoshida, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 18, 1977, Ser. No. 852,971

Claims priority, application Japan, Nov. 25, 1976, 51-141519

Int. Cl.[2] H03F *3/18*

U.S. Cl. 330—264 **21 Claims**

11. An amplifier, comprising:

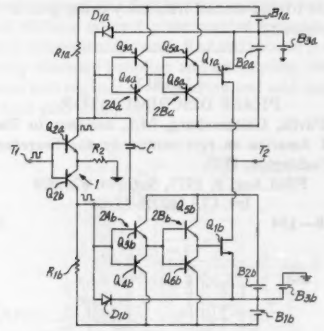
first and second field effect transistors connected in push-pull relation, each field effect transistor including gate, source and drain electrodes, one of the source and drain electrodes of said first field effect transistor being connected in common to one of the source and drain electrodes of said second field effect transistor and to an output terminal, and the other of the source and drain electrodes of each field effect transistor being adapted to receive a DC energizing voltage;

input signal supply means for supplying input signals for said first and second field effect transistors;

first and second impedance converting means for coupling said input signal supply means to said first and second field effect transistors, respectively, each of said impedance

converting means having a relatively low output impedance; and

first and second voltage limiting means connected between said input signal supply means and the source electrodes of said



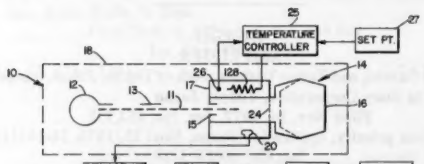
first and second field effect transistors, respectively, to limit the forward biasing of said first and second field effect transistors and thereby limit the maximum inherent input gate capacitance of said first and second field effect transistors.

4,128,814

EXTERNAL BULB VARIABLE VOLUME MASER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Victor S. Reinhardt, Gaithersburg, and Peter O. Cervenka, Rockville, both of Md.

Filed Nov. 30, 1977, Ser. No. 856,464
Int. Cl.[2] H01S 1/06
U.S. Cl. 331—94 **8 Claims**



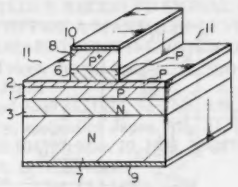
1. In an atomic or molecular frequency standard wherein a collimated beam of atomic or molecular particles is directed through an aperture into a variable volume, constant surface area storage bulb so that there are a random number of collisions between the particles and wall of the bulb and the frequency of the standard is shifted in response to the collisions, said bulb having a fixed volume portion located in a resonant cavity from which the frequency standard is derived, and a variable volume portion exterior to the cavity, said cavity having a length to width ratio of at least 1.5:1 so that stability of the standard is attained without the need for a feedback loop.

4,128,815

SINGLE TRANSVERSE MODE OPERATION IN DOUBLE HETEROSTRUCTURE JUNCTION LASER

Hitoshi Kawaguchi, Higashi Yamato, and Yoshitaka Furukawa, Musashino, both of Japan, assignors to Nippon Telegraph and Telephone Public Corp., Tokyo, Japan

Filed Sep. 23, 1976, Ser. No. 725,777
Claims priority, application Japan, Oct. 7, 1975, 50-121162
Int. Cl.[2] H01S 3/19
U.S. Cl. 331—94.5 H **15 Claims**



1. A single transverse mode semiconductor laser which comprises a semiconductor structure having optical resonator defining parallel opposed surfaces, said semiconductor structure comprising:

(a) a semiconductor substrate of a first conduction type;

(b) an optical confinement semiconductor layer of the first conduction type that is provided on said semiconductor substrate and has a refractive index of n_3;

(c) an optical waveguide active semiconductor layer that is provided on said optical confinement semiconductor layer and has a refractive index of n_1;

(d) a buffer semiconductor layer of a second conduction type that is provided on said optical waveguide active semiconductor layer, and has a refractive index of n_2;

(e) a mode controlling striped semiconductor layer of the second conduction type that is provided on said buffer semiconductor layer, has a width a, and has a refractive index of n_6;

(f) a contact forming semiconductor cap layer of the second conduction type that is provided on said mode controlling striped semiconductor layer;

(g) a first ohmic contact provided on said contact forming semiconductor cap layer; and

(h) a second ohmic contact provided on the bottom surface of said substrate;

wherein said refractive indexes satisfy the relations:

$$n_6 \leqq n_2 < n_1 \text{ and } n_3 < n_1; \text{ and}$$

said width a of said mode controlling striped semiconductor layer satisfies the relation:

$$a \leqq \lambda_o/(2n_1\sqrt{2\Delta n}),$$

where λ_o is the wavelength of propagated light in free space and Δn is a specific equivalent refractive index difference given by:

$$\Delta n = 1 - \sqrt{1 - \frac{n_A^2 - n_B^2}{n_1^2}},$$

wherein n_A is a standardized propagation for a first region, said first region including said mode controlling striped semiconductor layer and the portions of said optical confinement, optical waveguide, and buffer semiconductor layers that lie beneath said mode controlling striped semiconductor layer, and n_B is a standardized propagation constant for a second region, said second region including the portions of said optical confinement, optical wave-

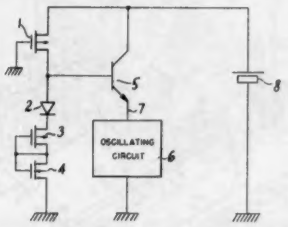
guide active, and buffer semiconductor layers that are adjacent to said first region.

4,128,816

ELECTRONIC CIRCUIT

Nobuo Shimotsuma, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jul. 18, 1977, Ser. No. 816,688
Claims priority, application Japan, Jul. 16, 1976, 51/84754
Int. Cl.[2] H03B *5/36*
U.S. Cl. 331—116 R **8 Claims**



1. An electronic circuit comprising a reference voltage generating circuit, a voltage controlled element, a load circuit and power source,

said reference voltage generating circuit comprising a current limiting element connected in series with a reference voltage setting circuit comprising a P channel MOS transistor and an N channel MOS transistor in which a gate of said P channel MOS transistor is connected with a gate of said N channel MOS transistor and with drains of said P channel MOS transistor and said N channel MOS transistor,

said voltage controlled element being controlled by an output of a connecting point between said current limiting element and said reference voltage setting circuit, and being connected in series with said load circuit, and said load circuit including a C-MOS inverter and receiving a constant voltage from said voltage controlled element,

said power source being connected with said reference voltage generating circuit in parallel with said voltage controlled element connected in series with said load circuit.

4,128,817

VOLTAGE CONTROLLED OSCILLATOR WITH PHASE CONTROL CIRCUITS

Hiroshi Gomi, Fukaya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 2, 1977, Ser. No. 773,689
Claims priority, application Japan, Mar. 3, 1976, 51-22270; Mar. 9, 1976, 51-24646; Mar. 9, 1976, 51-24647; Mar. 10, 1976, 51-24998
Int. Cl.[2] H03B *3/04;* **H04N** *9/46*
U.S. Cl. 331—177 R **11 Claims**

1. A voltage controlled oscillator comprising:

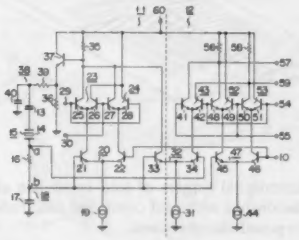
a differential amplifier having a pair of input terminals and an output terminal;

a resonant circuit connected in a closed loop between one of said input terminals and the output terminal of said differential amplifier, to supply a reference signal of predetermined frequency to said one input terminal of said differential amplifier;

phase-shifting means, connected between said respective differential amplifier input terminals for generating a phase shifted reference signal phase shifted from said reference signal by a predetermined amount for application to the other input terminal of said differential amplifier;

anti-phase signal generating means, responsive to said phase shifted reference signal, for generating an anti-phase signal 180° out of phase with said phase shifted reference signal;

control-addition means, responsive to signals indicative of said phase shifted reference and anti-phase signals and a magnitude control signal applied thereto, for controlling the magnitudes of said phase shifted reference and anti-



phase signals in accordance with said magnitude control signal and for generating a signal indicative of the vector sum of said phase shifted and anti-phase signals; and

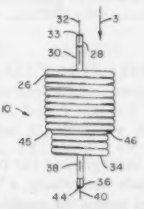
means for generating a signal indicative of the sum of said control-addition means output signal and said differential amplifier output signal and for generating therefrom a positive feedback signal in said closed loop.

4,128,818

ELECTRICAL FREQUENCY RESPONSIVE STRUCTURE

Michael B. Scherba, Birmingham, Mich., assignor to PYROHM, INC., Farmington Hills, Mich.

Filed Apr. 13, 1977, Ser. No. 787,011
Int. Cl.[2] H03H *5/08;* **H01F** *5/00, 27/00*
U.S. Cl. 333—70 S **6 Claims**



1. An electrical frequency responsive circuit comprising a first electrical coil of relatively large diameter having an axis of generation, a second electrical coil of relatively small diameter having an axis of generation and an end positioned axially at least partly within the first electrical coil, said first coil having an inner diameter slightly smaller than the outer diameter of the second coil, the second coil is screwed into the first coil and insulating material extending between the first and second coils.

4,128,819

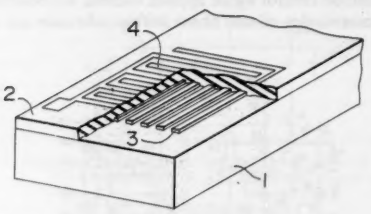
SURFACE ELASTIC WAVE DEVICE

Showko Shiokawa, Yokohama; Takaaki Kusakabe, Tokyo; Toyosaka Moriizumi, Tokyo, and Tsutomu Yasuda, Tokyo, all of Japan, assignors to Toko, Inc., Tokyo, Japan

Filed May 25, 1977, Ser. No. 800,544
Claims priority, application Japan, Sep. 30, 1976, 51-117737; Sep. 30, 1976, 51-131746[U]; Sep. 30, 1976, 51-131747[U]
Int. Cl.[2] H03H *9/04, 9/26, 9/32;* **H01L** *41/10*
U.S. Cl. 333—72 **5 Claims**

1. A surface elastic wave device comprising a substrate of an insulating material, a thin film of a piezoelectric material, provided on said substrate, input transducer means for transmitting a surface elastic wave, and output transducer means for

receiving said surface elastic wave, said input transducer means including a comb-like electrode comprising interdigital finger, and a plurality of electrodes extending at right angles



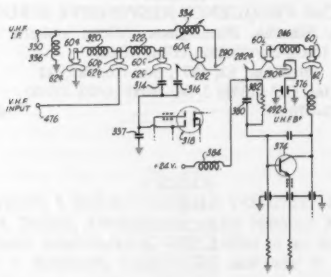
across the interdigital fingers of said comb-like electrode in opposing relationship with said comb-like electrode with said thin film interposed therebetween.

4,128,820

COMBINATION VHF AND UHF TUNER ARRANGEMENT

James E. Krepps, Jr., Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed May 16, 1977, Ser. No. 796,848
Int. Cl.[2] H03J *5/30*
U.S. Cl. 334—1 **11 Claims**



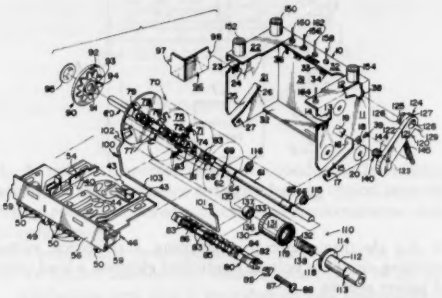
1. A television tuner arrangement for receiving both VHF and UHF television signals comprising, a VHF tuner having a main tuning shaft, detent means for establishing an even number of equally spaced detent positions for said main tuning shaft, said VHF tuner including a fixed stator member carrying a plurality of stator contacts, means carried by said main tuning shaft for supporting a plurality of VHF tuning panels each of which includes a plurality of tuning coils which are connected to said stator contacts in alternate detent positions of said main tuning shaft, an oscillator coil on each of said VHF tuning panels which is connected between first and second contacts carried thereby, a conductive switching member secured to said stator member and movable from a first to a second position by engagement of one of said first panel contacts therewith in said alternate detent positions of said main tuning shaft, a VHF oscillator in said VHF tuner, means including said movable switching member for supplying an enabling potential to said VHF oscillator in said alternate detent positions of said main tuning shaft, a UHF tuner having a continuously variable rotor shaft rotation of which is effective selectively to receive all of the seventy UHF stations, means interconnecting said main tuning shaft and said rotor shaft so that said rotor shaft is moved a distance equal to the width of one UHF channel when said main tuning shaft is moved a predetermined number of detent positions, a fixed switching member connected to said movable switching member when said movable member is in said first position, and means including said fixed switching member for supplying an enabling potential to said UHF tuner when said main tuning shaft is positioned between said alternate detent positions.

4,128,821

TURRET TYPE TELEVISION TUNER

Kazuo Kato, Kyoto, and Michiaki Narihiro, Ueno, both of Japan, assignors to New Nippon Electric Company, Ltd., Osaka, Japan

Filed Mar. 29, 1977, Ser. No. 782,416
Claims priority, application Japan, Oct. 12, 1976, 51-122521
Int. Cl.[2] H03J *5/30*
U.S. Cl. 334—51 **10 Claims**



1. A turret type tuner comprising a chassis assembly including a front wall means, rear wall means, and side wall means, a plurality of external connecting terminals operatively secured to said wall means, a rotor assembly including turret means, and selector shaft means, detent biasing means on said selector shaft means, and a plurality of coil units operatively arranged in said rotor assembly, a stator assembly including a stator bar and a plurality of spring contacts as well as a tuner circuit means including electrical circuit elements, a shield plate and printed circuit board means electrically and mechanically connected to said spring contacts and to said electrical circuit elements, bearing fitting means provided in said chassis assembly to mount said rotor assembly and said stator assembly, and torsion bar spring means having interconnected first and second arm means forming bearing means and a detent drive for said selector shaft means, said detent drive employing the torsional force of said torsion bar spring means, said bearing fitting means comprising notch bearing means formed in said front wall means and indent bearing means formed on said selector shaft means, said indent bearing means being located in said notch bearing means and wherein said torsion bar spring means is operatively arranged to apply pressure to the selector shaft means in said indent bearing means at the inside of said front wall means through said first arm means of said torsion bar spring means.

4,128,822

POLYPHASE CIRCUIT BREAKER HAVING IMPROVED TRIP CROSSBAR ASSEMBLY

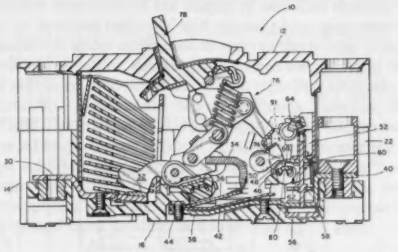
Maurice W. Peterson, Jr., Swisher, Iowa, assignor to Square D Company, Park Ridge, Ill.

Filed Feb. 28, 1977, Ser. No. 773,092
Int. Cl.[2] H01H *71/16*
U.S. Cl. 335—8 **11 Claims**

1. A multi-pole circuit breaker including a moulded base having a bottom wall, longitudinally extending side walls and a pair of spaced apart parallel compartment walls located intermediate said side walls to define a plurality of compartments with each compartment wall having a recess, a pair of contacts in each compartment controlled by an operating assembly to extend an electrical circuit from a line terminal through a load terminal and including fault condition sensing means adapted to sense a fault condition in said circuit to

control a trip crossbar having a longitudinal axis extending through said recess of each compartment wall and to pivot said crossbar for releasing said operating assembly to open said contacts in response to a fault condition in said circuit, the improvement comprising:

a pair of first surfaces on said crossbar formed at a predetermined diverging angle to each other and extending in a radial outward direction, and



a rail integrally formed on each compartment wall and projecting transverse to said longitudinal axis into a respective one of said recesses and having second surfaces converging towards each other at an angle less than said predetermined angle for receipt between said pair of first surfaces to provide a pivot axis for said crossbar.

4,128,823

SWITCH

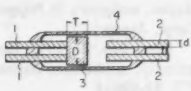
Akira Tanaka, Zama; Yuji Hayashi, Suzaka; Makoto Kassai, Yokohama, and Toshito Hara, Sagamihara, all of Japan, assignors to Fujitsu Limited, Japan

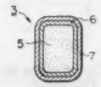
Filed Dec. 2, 1976, Ser. No. 746,993

Claims priority, application Japan, Dec. 25, 1975, 50-153973; Feb. 10, 1976, 51-12799

Int. Cl.[2] H01H *1/54*

U.S. Cl. 335—196 **23 Claims**





1. A switch comprising two sets of rod-shaped fixed electrodes formed of a magnetic material and one cylindrical moving electrode formed of a permanent magnet, each set of the fixed electrodes being fixed to the respective end of a cylindrical vessel so that the ends of each set of the fixed electrodes face the ends of the other set of the fixed electrodes with the moving electrode capable of reciprocating between the ends of the two sets of fixed electrodes inside the cylindrical vessel, wherein said moving electrode is formed of a rare earth element-cobalt type permanent magnet which comprises at least one adhesive layer of a metal selected from the group consisting of silver, nickel, copper and alloys thereof on the surface of said permanent magnet, and at least one contact layer of a metal selected from the group consisting of rhodium, wolfram, rhenium, ruthenium and alloys thereof, silver-wolfram and gold-chromium on said adhesive layer of metal, and at least said permanent magnet and said adhesive layer of metal are thermally diffused to each other.

4,128,824

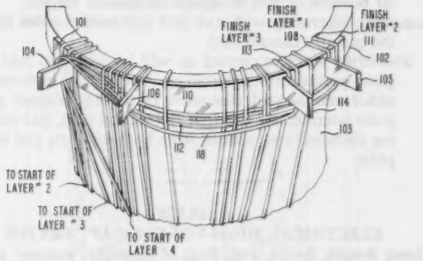
MULTILAYERED DEFLECTION YOKE

John W. Mirsch, Levittown, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,854

Int. Cl.[2] H01F *5/00*

U.S. Cl. 335—213 **9 Claims**



1. A deflection yoke comprising:

a core;

at least two layers of conductor turns wound about said core, including a return traverse conductor traversing said core from a finishing conductor turn of one of said first and second layers to a starting conductor turn of the other of said layers;

at least three projections located adjacent an outer surface of said core for providing pivot points for said return traverse conductor, a first projection located near a starting conductor turn of at least one of said first and second layers, a second projection located near a finishing conductor turn of at least one of said first and second layers, and a third projection located between said first and second projections for preventing said return traverse conductor from protruding beyond an end of said core.

4,128,825

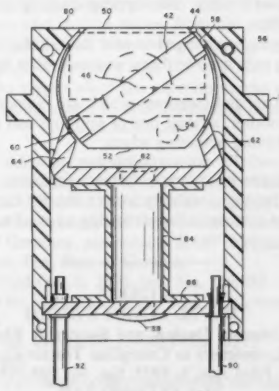
MAGNETICALLY ACTUATED INDICATOR

Elmer W. Madsen, Bristol, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,008

Int. Cl.[2] H01F *7/08, 7/14*

U.S. Cl. 335—272 **13 Claims**



1. An elongated permanent magnet having one north pole at a first end and a south pole at the second end;

means for pivoting said magnet about a geometric axis which extends transversly to the geometric axis of said elongated permanent magnet at a point intermediate said ends thereof, said means for pivoting allowing rotational

travel of said magnet between a first angular position and a second angular position;

first and second poles carried by said housing and disposed in spaced relationship to each other, said first pole being proximate to said one end of said elongated magnet in said one angular position of said elongated permanent magnet and said second pole being proximate to said second end of said elongated permanent magnet in said second angular position of said elongated permanent magnet;

a coil cooperating with said first and second poles to vary the polarity thereof; and

interfering surfaces carried on said housing and said elongated permanent magnet to prevent angular movement of either end of said elongated permanent magnet past a point intermediate said first and second pole, said interfering surfaces being spaced from both said first and second poles.

4,128,826
ELECTRICAL HIGH-VOLTAGE APPARATUS

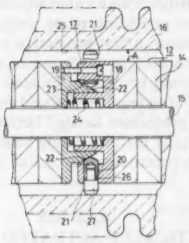
Heinz Brecht, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,425

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627769

Int. Cl.[2] H01C *7/18*

U.S. Cl. 338—204 **10 Claims**



1. An electric high-voltage apparatus adapted to be arranged within the interior of a hollow cylindrical insulating bushing member and in spaced relationship to the interior surfaces thereof, said apparatus comprising:

a shaft;

a plurality of resistor disks arranged along and carried by said shaft;

a centering body arranged on said shaft in the region thereof carrying said resistor disks, said centering body comprising:

first and second members which are movable relative to one another, at least one of said first and second members having actuating edges;

several radially outward-pointing, movable support elements distributed over the circumference of said body each having a radially inner chamfer for cooperating with a corresponding actuating edge of said one member.

4,128,827
TRAVEL ALARM SYSTEM

Donald F. Coleman, Dunlap, and Sammy J. Rhodes, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1977, Ser. No. 785,797

Int. Cl.[2] B60Q *5/00*

U.S. Cl. 340—52 R **14 Claims**

1. A alarm system comprising:

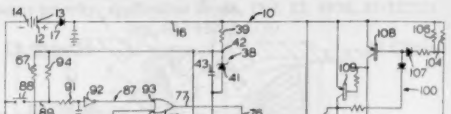
an electrically energized alarm (**11**);

an electrical power source (**12**);

switching means (**19**) connected between said power source and said alarm, said switching means being of the type rendered conductive for energizing said alarm in response to delivery of at least one electrical signal thereto and being rendered nonconductive for deenergizing said alarm in the absence of such an electrical signal;

a switch (**36**) connected to the power source, and being movable between first and second positions;

first means (**46**) connected to the switching means for delivering a first electrical signal to the switching means at the first position of the switch;



second means (**68**) connected to the switching means for delivering a second electrical signal to the switching means at the first position of the switch, said second electrical signal being separate from and independent of said first electrical signal;

timer means (**80**) for stopping the delivery of the first signal to the switching means only after the first signal has been delivered to the switching means for a predetermined period of time; and

manual override means (**87**) for manually selectively stopping delivery of the second signal to the switching means.

4,128,828
DIFFERENTIAL DETECTION SYSTEMS WITH NON-REDUNDANT ERROR CORRECTION

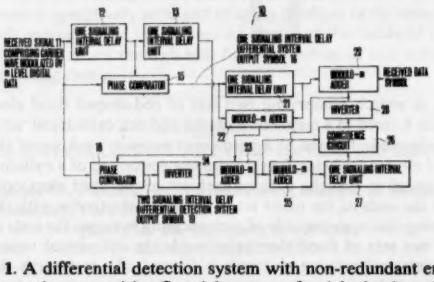
Shuichi Samejima, Yokohama, and Kenkichi Hirade, Yokosuka, both of Japan, assignors to Nippon Telegraph and Telephone Public Corp., Japan

Filed Sep. 26, 1977, Ser. No. 836,759

Claims priority, application Japan, Sep. 28, 1976, 51-116271; Jul. 25, 1977, 52-89014

Int. Cl.[2] G06F *11/12*

U.S. Cl. 340—146.1 AQ **9 Claims**



1. A differential detection system with non-redundant error correction comprising first delay means for delaying by n (n is an interger) signaling intervals a received signal comprising a carrier wave modulated by m (m is an interger) level digital data; a first phase comparator for comparing the phase of the output of said first delay means and the phase of a signal received in the present signaling interval to detect a first symbol; second delay means for delaying said first mentioned received signal by $2n$ signaling intervals; a second phase comparator for comparing the phase of the output of said second delay means

and the phase of the signal received in the present signaling interval to detect a second symbol; and a decoder responsive to the first and second symbols produced by said first and second phase comparators respectively, said decoder comprising third delay means for delaying said first symbol by *n* signaling intervals, a first modulo *m* adder for performing a modulo *m* addition operation of the output of said third delay means and said first symbol, a second modulo *m* adder for performing a modulo *m* addition operation of the output of said first modulo *m* adder and an inverted output of said second phase comparator, a third modulo *m* adder connected to receive the output of said second modulo *m* adder, fourth delay means for delaying the output of said third modulo *m* adder by *n* signaling intervals, a logic circuit for determining the coincidence between the output of said fourth delay means and the output of said second modulo *m* adder, a fourth modulo *m* adder for performing a modulo *m* addition operation of an inverted output of said logic circuit and the output of said third delay means, and means for applying said inverted output of said logic circuit to one input of said third modulo *m* adder.

4,128,829

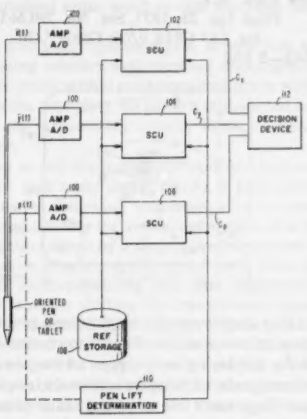
SIGNATURE VERIFICATION METHOD AND APPARATUS UTILIZING BOTH ACCELERATION AND PRESSURE CHARACTERISTICS

Noel M. Herbst, Mount Kisco, and Chao N. Liu, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,190

Int. Cl.[2] G06K *9/10*

U.S. Cl. 340—146.3 SY **24 Claims**



1. A method for verifying a signature which comprises producing and storing a plurality of first signal sets, each set comprising a plurality of electrical signals, wherein at least one set represents acceleration forces and another set represents pressure forces, each transmitted by a known signer's hand to a writing instrument during the writing on a writing surface of at least one signature by a known person, producing and storing a plurality of second signal sets each comprising a plurality of electrical signals representative of said acceleration and pressure forces by a putative signer at a different time, segmenting said plurality of first and second signal sets for both the known and putative signatures to facilitate identifying regions of high probable correlation, individually correlating similar segment pairs in corresponding signal sets of said first and second sets representing acceleration components and pressure components respectively, combining the correlation results obtained for all of said regions in all of said sets and utilizing this combined correlation value to produce a resultant correlation level value.

4,128,830

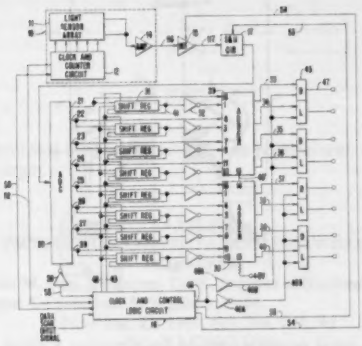
APPARATUS FOR PROVIDING A COMPENSATION SIGNAL FOR INDIVIDUAL LIGHT SENSORS ARRANGED IN A PREDETERMINED RELATION

Gayle A. Weythman, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,881

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 AG **7 Claims**



1. An apparatus for providing a compensation for dark scan noise level for each of a plurality of individual light sensors arranged in a predetermined relation including:

means to produce a separate output signal from each of the individual light sensors in accordance with the level of light received by each of the individual light sensors;

said producing means producing a separate compensation signal for dark scan noise level from each of the individual light sensors when the individual light sensors are prevented from being subjected to light;

storage means for receiving and storing the separate compensation signal from said producing means for each of the light sensors to compensate for the dark scan noise level affecting the accuracy of the separate output signal of the same light sensor from said producing means;

means to connect said producing means to said storage means only when the individual light sensors are prevented from being subjected to light;

subtracting means to subtract the separate compensation signal from said storage means from the output signal of the same light sensor from said producing means to produce a signal compensated for the dark scan noise level;

and means to supply all of the separate output signals from said producing means to said subtracting means.

4,128,831

DEVICE FOR THE CONTINUOUS MONITORING OF OIL LEAKS ON OXYGEN COMPRESSORS

Adam Rensch, Frankenthal, and Otto Albert, Weinheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 6, 1976, Ser. No. 730,283

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544730

Int. Cl.[2] G08B *21/00*; F01B *31/12*

U.S. Cl. 340—605 **5 Claims**

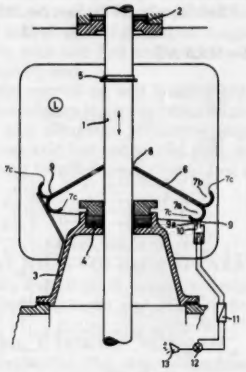
1. A device for continuously monitoring the occurrence of oil leakage about the shaft seals of oxygen compressors having reciprocating or rotating shafts, said device comprising:

a collecting element surrounding the shaft from all sides in the vicinity of the shaft seals,

a collecting channel having one or more orifices formed therein located about the periphery of said collecting element, said collecting channel terminating in an inward-

ly-directed lip portion which substantially surrounds and is spaced from said shaft,

a vessel means located below said orifices for accumulating said oil leakage from said collecting element and channel, and



an electrical triggering means for actuating a signal when said oil leakage accumulating in said vessel reaches a predetermined amount.

4,128,832

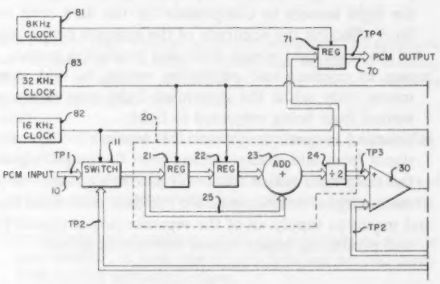
COMBINED ENCODER/DECODER

William L. Betts, St. Petersburg, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 8, 1976, Ser. No. 647,536

Int. Cl.[2] H03K *13/24*

U.S. Cl. 340—347 DD **7 Claims**



7. A combined encoder and decoder for converting between pulse code modulation (PCM) signals and differential code modulation (DM) signals comprising:

(a) a PCM input;

(b) a PCM output;

(c) a DM input;

(d) a DM output;

(e) an interpolator connected to provide PCM signals to said PCM output;

(f) an integrator;

(g) a comparator connected to receive PCM signals from said interpolator and said integrator and connected to provide DM signals to said DM output;

(h) first means for periodically alternatively connecting said PCM input and integrator to said interpolator; and

(i) second means synchronized to said first means for periodically alternatively connecting said DM input and comparator to said integrator.

4,128,833

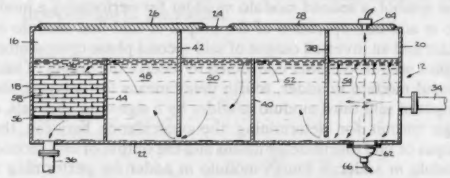
HOTWELL ALARM SYSTEM

Emmanuel J. Tsavaris, 28-33 Hobart St., Woodside, N.Y. 11377

Filed Apr. 7, 1977, Ser. No. 785,608

Int. Cl.[2] G08B *21/00*; B01D *35/00, 43/00*

U.S. Cl. 340—603 **8 Claims**



1. A pollution detection device comprising an enclosed housing provided with a water inlet line at one end and a water outlet line at the other end, means within the housing to slow up the flow of water therethrough, a lamp disposed in the floor of the housing, with its light beam directed toward the roof of the housing, a photoelectric cell disposed in the roof of the housing in registry with the light beam, and an alarm circuit in engagement with the photoelectric cell, whereby a diminution of light from the lamp causes the photoelectric cell to activate the alarm.

4,128,834

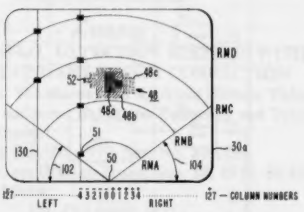
RANGE MARK GENERATION

Kazuo Katagi, Woodland Hills, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,661

Int. Cl.[2] G01S *9/00*; G08B *5/36*

U.S. Cl. 343—5 EM **8 Claims**



7. In a radar display system employing a pivotable antenna for scanning, at least a sector of space to receive return signals therefrom for displaying on a screen an image corresponding to said return signals, said display screen also displaying at least one arcuate range mark line at a fixed radial distance about an origin which corresponds to said antenna, said image being created by a series of sweep lines each intensity modulated to produce said image including said arcuate range mark, apparatus for determining the position of the portion of said range mark along each sweep line on said display screen comprises in combination:

means for storing for each said sweep line a first value corresponding to the time required for the sweep line to sweep from the origin on said screen of said sweep line to the position of said portion of said range mark therealong;

means responsive to a particular sweep line being created for producing from said storage means a signal corresponding to said value associated with said particular sweep line;

means responsive to said value corresponding signal for producing, after a time laspe corresponding to the time indicated by said value corresponding signal, a position signal indicative of the position of said sweep along said particular sweep line at which said range mark appears; and

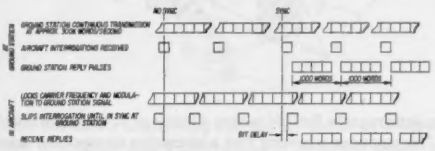
means responsive to said position signal for producing on

said screen the part of said range mark corresponding to the sweep line.

4,128,835
METHOD AND APPARATUS FOR MEASURING DISTANCE BETWEEN AN AIRCRAFT AND A GROUND STATION

James L. Russell, Germantown, Md., assignor to Arinc Research Corporation, Annapolis, Md.

Continuation-in-part of Ser. No. 827,009, Aug. 23, 1977, abandoned. This application Feb. 2, 1978, Ser. No. 874,480
Int. Cl.[2] G01S 9/04, 9/56
U.S. Cl. 343—6.5 LC **23 Claims**



17. A distance measuring method for at least two communication stations comprising the steps of:

transmitting a repeating bit pattern having a first predetermined number of bits from a first station, said repeating bit pattern forming a plurality of code words,

receiving and locking onto said repeating bit pattern at at least one second station,

transmitting from said second station an interrogation signal having a predetermined bit pattern in synchronism with a predetermined code word in said received repeating bit pattern,

receiving said interrogation signal at said first station and determining whether said received interrogation signal is in synchronism within predetermined limits with any code word in the repeating bit pattern transmitted by said first station and transmitting a reply signal if synchronism is achieved,

monitoring at said second station said first station transmissions for said reply signal during a first predetermined time interval following transmission of an interrogation signal, and shifting the transmission time of a subsequent interrogation signal by a second predetermined number of bits relative to said predetermined code word if no reply signal is received during said first predetermined time interval, and for shifting the transmission time of subsequently transmitted interrogation signals relative to said predetermined code word which have not been preceded by the receipt of a reply signal in said first predetermined time interval by additional predetermined numbers of bits,

counting at said second station the number of bits of shifting imparted to said transmitted interrogation signal,

counting at said second station the number of whole word intervals occurring in said received repeating code pattern between the transmission of an interrogation signal and the receipt of said reply signal, and

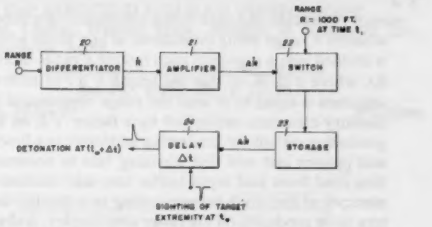
calculating the distance between said first and second station from said counted number of whole word intervals and said counted number of shifted bits.

4,128,836
TIME DELAY COMPUTER FOR ORDNANCE FUSE

Edward Ramos, and Joseph V. Cuneo, both of Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 14, 1960, Ser. No. 62,804
Int. Cl.[2] G01S 9/04; F42C 13/04
U.S. Cl. 343—7 PF **4 Claims**

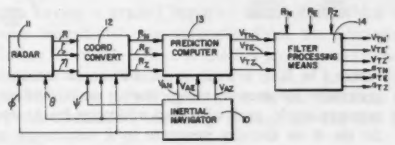
1. In a missile having a fuze for detonating the missile warhead in the proximity of a target, means associated with said fuze for sensing the presence of a target, and means responsive to the sensing of a target by said sensing means for delaying the detonation of said warhead for an internally varied time interval until said missile is at an optimum position with respect to said target.



4,128,837
PREDICTION COMPUTATION FOR WEAPON CONTROL

Jerome M. Page, Fullerton, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 22, 1968, Ser. No. 747,781
Int. Cl.[2] G06G 7/80
U.S. Cl. 343—7 G **18 Claims**



1. Target tracking apparatus employing second order prediction and comprising in combination

an inertially roll-stabilized range-and-angle sensor for providing output signals indicative of the range tracking and angle tracking errors thereof;

range error resolution means responsive to a set of computed polar coordinate target position data for resolving the sensor tracking error output signals relative to a preselected inertially stabilized Cartesian coordinate system;

doubly integrating feedback means responsive to said resolved tracking error signals and to velocity outputs of the inertial navigator for computing the components of target position, velocity and acceleration resolved in said Cartesian coordinate system; and

target position computing means responsive to said resolved target data components computed by said feedback means for further computing the polar coordinates of said computed target position, said sensor being responsive to said computed polar coordinate target position data.

4,128,838
DIGITAL SCAN CONVERTER

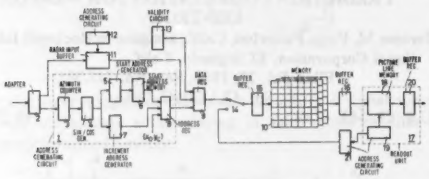
Antoon H. Brands, Borne, and Jouke Gietema, Hengelo, both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Feb. 7, 1977, Ser. No. 765,937
Claims priority, application Netherlands, Feb. 16, 1976, 7601535
Int. Cl.[2] G01S 7/06, 9/02
U.S. Cl. 343—55 C **2 Claims**

1. A digital scan converter for displaying on a raster scan display video data provided by a radar sensor as a field of view is scanned in a predetermined pattern at a first scan rate, said converter comprising an input buffer for storing quantized video data at addresses corresponding to said predetermined

pattern scanned at said first rate; a random access memory for storing data received from said input buffer, said random access memory comprising N × N submemories each having *a* × *a*

memory elements and each being simultaneously accessible, wherein a range being considered at any given azimuth ϕ is divided into n segments each having *k* range increments Δr, where $n \leqq N$, so that the length $k \Delta r$ of each of said segments is equal to at least the range represented by "*a*" memory elements, multiplied by a factor $\sqrt{2}$; an address generating circuit for generating addresses as a function of said pattern and said first scanning rate to accommodate data read from said input buffer into said random-access memory at locations corresponding to a display line pattern to be produced on the raster scan display; said address generating circuit including an azimuth counter for generating signals representative of an azimuth ϕ, a sine/cosine generator coupled to said azimuth counter for generating signals representative of sin ϕ and cos ϕ, a start address generator coupled to said sine/cosine generator for producing start address values $lk \Delta r \cos \phi$ and $lk \Delta r \sin \phi$,



where $l = 0, 1, 2, \ldots, n-1$, and an increment address generator for incrementing, during each random access memory cycle, each of n start addresses by $\Delta r \cos \phi$ and $\Delta r \sin \phi$ to thereby generate in *k* successive memory cycles the addresses $x = x_c + (lk+m) \Delta r \cos \phi$ and $y = y_c + (lk+m) \Delta r \sin \phi$, where x_c and y_c represent the coordinates of the radar sensor position, $l = 0, 1, 2, \ldots, n-1$ in each memory cycle, and $m = 0, 1, 2, \ldots, k-1$, the data stored in said input buffer corresponding to the n ranges of which the addresses are defined in each memory cycle, being transferred to the *x* and *y* address-defined positions of said random-access memory in the respective memory cycle, allocating a position within one submemory by one address only; and a readout unit for reading out data stored in said random-access memory at a second rate for display on the raster scan display, the data for each picture line being read out simultaneously from the respective N submemories, said readout unit including means for storing data for at least one picture line which are read out in the sequence required for presentation on the raster scan display.

4,128,839

MEANS FOR ACCUMULATING AIRCRAFT POSITION DATA FOR A BEACON BASED COLLISION AVOIDANCE SYSTEM AND OTHER PURPOSES

Arthur D. McComas, Baltimore County, Md., assignor to The Bendix Corporation, Southfield, Mich.

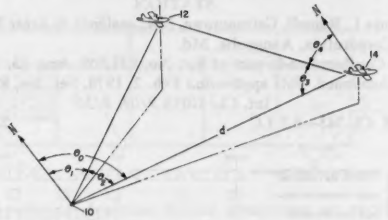
Filed Jun. 28, 1977, Ser. No. 810,701
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—112 CA **2 Claims**

1. Means for use in a beacon based collision avoidance system wherein a fixed station transmits an interrogation message along a relatively narrow beam radiated from the fixed station and wherein said relatively narrow beam is scanned through a field of interest on a discoverable schedule and wherein an aircraft illuminated by said beam normally transponds a first reply message said means for use comprising:

an addressable transponder for transmitting a second reply message when addressed, said addressable transponder being arranged in predetermined fixed spatial relationship with said fixed station; and, a protected aircraft comprising:

means for discovering said schedule;

means for transponding a reply message when said protected aircraft is illuminated by said relatively narrow beam;



an interrogator for addressing a message to said addressable transponder whereby said addressable transponder transmits said second reply message, the range between said protected aircraft and said addressable transponder being determined thereby; and,

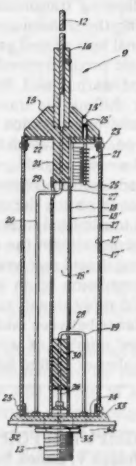
a directionable antenna means responsive to said range and said schedule for steering a beam therefrom.

4,128,840

RESONANT RE-ENTRANT CAVITY WHIP ANTENNA

William Tucker, 1965 S. Ocean Dr., Apt. 18-S, Hallandale, Fla. 33009

Filed Jan. 10, 1977, Ser. No. 757,994
Int. Cl.[2] H01Q 1/32, 9/18
U.S. Cl. 343—715 **5 Claims**



1. A re-entrant type of cavity resonator whip antenna comprising the combination of:

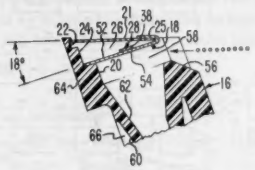
a base mounted re-entrant cavity,

a five eighths wave whip antenna coaxially mounted on said cavity and electrically coupled thereto whereby said antenna is resonated, bandpass filtered, and impedance matched to the transmission line.

4,128,841
DROPLET MICROPHONE

Michael K. Brown, Canton; Kyriakos Christou, Livonia; David E. Lundquist, Birmingham; Earl P. Maidment, Royal Oak, and Ronald G. Shell, Dearborn Heights, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 28, 1977, Ser. No. 837,645
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 8 Claims



1. A device for converting the impact forces of a moving stream of droplets into a corresponding electrical signal, said device comprising:

flexing means disposed in the path of the moving droplet for flexing in response to an impinging droplet;

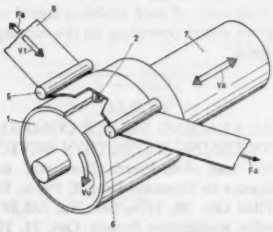
support means for supporting said flexing means in the droplet path; and

piezo electric transducer means including a cantilever, one end thereof being fixedly secured to said support means and the opposite end being operatively associated with said flexing means to move therewith the flexing means for generating an electrical signal, said cantilever experiencing bending deformation, wherein the structure including said flexing means and said transducer means has a resonant frequency substantially equal to an integral multiple of the frequency of said stream of droplets.

4,128,842
ELECTROSTATIC PRINTING DEVICE WITH MONOCRYSTALLINE STYLUS

Ulf Rothgordt, Norderstedt; HansDieter Hinz, Tornesch, both of Fed. Rep. of Germany, and Gerrit Verspui, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1976, Ser. No. 723,053
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541367
Int. Cl.[2] G03G *15/044*
U.S. Cl. 346—155 8 Claims

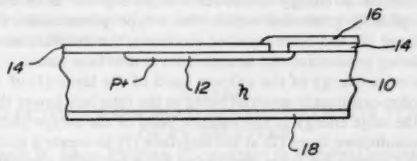


1. A device for the electrostatic printing of characters on an associated record carrier which comprises: an electrode device, means for moving the associated record carrier relative to said electrode, means for supplying controllable pulses to said electrode device during the relative movement of said electrode device and the record carrier, said electrode device sliding directly across the surface of the record carrier under pressure, said electrode device including a whisker mounted to be in galvanic contact with a metal holder, said whisker being a monocrystalline member.

4,128,843
GaP DIRECTED FIELD UV PHOTODIODE

Alice M. Chiang, Weston, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 14, 1977, Ser. No. 842,443
Int. Cl.[2] H01L *27/14, 29/90*
U.S. Cl. 357—30 8 Claims



1. An ultraviolet-sensitive photodiode comprising:

a GaP body having an ultraviolet radiation receiving surface;

an N type region in the GaP body;

a P type region in the GaP body proximate the ultraviolet radiation receiving surface and forming a PN junction with the N type region at a depth from the ultraviolet receiving surface of less than about 0.5 microns, the P type region having a graded impurity distribution which decreases essentially monotonically from the ultraviolet radiation receiving surface to the PN junction and creates an internal directed surface electric field of greater than about 10^3 V/cm which repels minority carriers from the ultraviolet radiation receiving surface toward the PN junction;

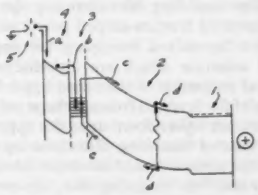
first contact means for providing electrical contact to the N type region; and

second contact means providing electrical contact to the P type region.

4,128,844
CAMERA TUBE TARGET STRUCTURE EXHIBITING GREATER-THAN-UNITY AMPLIFICATION

Arno Illenberger; Gert Ruprecht, and Klaus Berger, all of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 599,545, Jul. 28, 1975, abandoned. This application Sep. 26, 1977, Ser. No. 836,856
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1974, 2436990
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—31 12 Claims



1. In a television-camera pick-up tube, a novel target structure which exhibits greater-than-unity amplification (gain), the target structure having one side facing incident scene light and having an opposite side facing a scanning electron beam, the novel target structure comprising, in combination,

a glass plate (0) on that side of the target structure exposed to scene light;

a transparent signal electrode (1) on the side of the glass plate facing the electron beam;

a homogeneous layer (2) of n-type photoconductive semiconductor material on the side of the transparent signal electrode facing the electron beam;

a homogeneous layer (4) of n-type semiconductor material on the side of the photoconductive layer facing the beam, and having a resistivity greater than 10^8 ohm-centimeters,

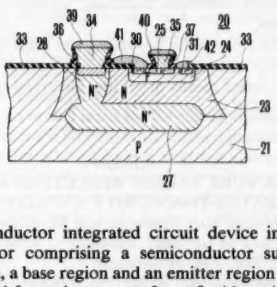
the interface (3) between the pair of n-type semiconductor layers being possessed of a multitude of interface states located at energy levels such as to capture both holes optically generated within the n-type photoconductive layer (2) and beam-injected electrons, the interface states being predominently acceptor-level interface states,

the edge energy of the valence band of the layer (4) of 10^8 ohm-centimeter material being at the interface lower than the edge energy of the valence band of the n-type photoconductive layer (2) at the interface (3) to create a potential barrier for holes preventing holes optically generated in the n-type photoconductive layer (2) from crossing the interface (3) to the beam-side of the target structure.

4,128,845
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES HAVING INVERTED FRUSTUM-SHAPE CONTACT LAYERS

Tetsushi Sakai, Tachikawa, Japan, assignor to Nippon Telegraph and Telephone Public Corp., Japan

Filed Jul. 19, 1976, Ser. No. 706,596
Claims priority, application Japan, Jul. 28, 1975, 50-91090
Int. Cl.[2] H01L *29/70, 23/48*
U.S. Cl. 357—51 **10 Claims**

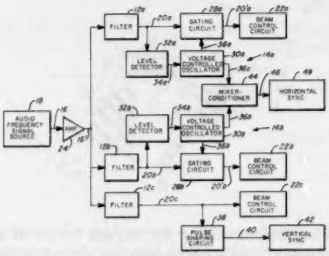


1. A semiconductor integrated circuit device including a bipolar transistor comprising a semiconductor substrate, a collector region, a base region and an emitter region which are spaced apart and formed at one surface of said semiconductor substrate, a plurality of inverted frustum-shape polycrystalline semiconductor contact layers having raised upper larger cross sectional surfaces and lower smaller cross sectional surfaces, one of said inverted frustum-shape polycrystalline semiconductor contact layers being formed on and in direct contact with each of said emitter region and said collector region, respectively, a first insulating film covering the raised side surfaces of said inverted frustum-shaped polycrystalline semiconductor contact layers and overlying the upper surface portions of said substrate which are included substantially within the vertical projection of the raised upper larger cross sectional surfaces of the inverted frustum-shape polycrystalline semiconductor contact layers down upon the upper surface of said substrate, a second insulating film covering the surface portions of said one surface of said substrate other than those areas covered by said first insulating film, the contact layers and said base region, a base electrode formed on said base region below the plane of the raised upper larger cross sectional surfaces of the inverted frustum-shape polycrystalline semiconductor contact layers and an emitter electrode and a collector electrode formed on the upper surfaces of the respective inverted frustum-shape polycrystalline semiconductor contact layers.

4,128,846
PRODUCTION OF MODULATION SIGNALS FROM AUDIO FREQUENCY SOURCES TO CONTROL COLOR CONTRIBUTIONS TO VISUAL DISPLAYS

Ernest G. Robinson, Jr., Houston, Tex., assignor to Denis J. Kracker, Houston, Tex.

Filed May 2, 1977, Ser. No. 792,936
Int. Cl.[2] H04N *1/46, 9/02;* **H04Q** *9/02*
U.S. Cl. 358—82 **23 Claims**



1. Apparatus for modulating electronically controlled visual display systems comprising:

(a) processing means for operating on audio frequency modulating signals to produce processed modulating signals for communication to at least one control circuit of a visual display system, whereby said control circuit controls the contribution of at least one color in a visual display of the visual display system, and for operation on said control circuit to modulate said contribution of color in said visual display;

(b) gating circuit means, as part of said processing means, for operating on at least one said modulating signal to selectively permit or block said communication of said modulating signal;

(c) gate control means, as part of said processing means and including voltage controlled oscillator means, for generating enabling signals for selectively enabling said gating circuit means for so permitting said modulating signal communication such that the frequency of each such enabling signal so generated is determined, at least in part, based on the value of a parameter of the corresponding modulating signal being so operated on by said gating circuit means in response to said enabling signal; and

(d) detector means, as part of said processing means, for responding to a parameter of each modulating signal so operated on by said gating circuit means to produce control signals, corresponding to each such modulating signal, for communication to said gate control means to operate on said voltage controlled oscillator means to vary the frequency of each enabling signal so enabling the gating circuit means operating on the corresponding modulating signal.

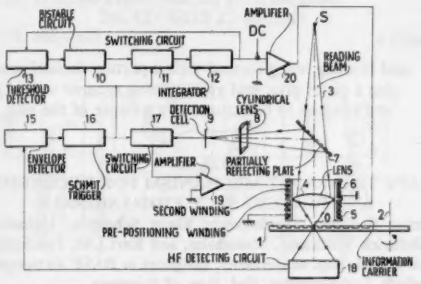
4,128,847
OPTICAL READING DEVICE COMPRISING A FOCUSSING DETECTION DEVICE

Gérald Roullet, and Jean-Pierre Bortuzzo, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Oct. 26, 1976, Ser. No. 735,891
Claims priority, application France, Oct. 31, 1975, 75 33465
Int. Cl.[2] G01J *1/20;* **H04N** *5/76*
U.S. Cl. 358—128 **5 Claims**

1. An optical reading device for the read-out of an information signal carried by a moving information carrier comprising a radiation source for emitting a radiation beam having an optical axis, a focussing device for projecting said radiation beam in a focussing spot on said information carrier, first means for displacing said spot along said optical axis about a mean position and in a first range, second means for displacing

said spot along said optical axis in a second range limited by two extreme positions and enclosing said first range, a position control loop comprising a first switching circuit, said loop acting upon said first displacing means for correcting variations in position occurring in said first range, a generator circuit having a control input and an output for supplying an approach signal formed by ascending and descending ramps which act on said second displacing means for moving said spot between said two extreme positions, said generator circuit comprising a bistable circuit having a control input and an output for supplying a signal having one of two predetermined values, a second switching circuit having an input connected to the output of said bistable circuit, a control input forming the



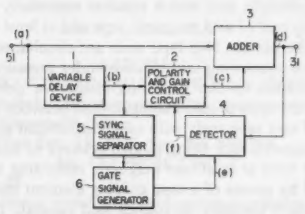
control input of said generator circuit and an output, integrator means having an input connected to the output of said second switching circuit, said control input of said bistable circuit being adapted for receiving change of state pulses when said approach signal reaches values corresponding to said extreme positions in said second range, and a detection circuit for detecting said information signal having an output for delivering a control signal, said control signal having a first and a second state according to whether an information signal is and is not detected, said control input of said first switching circuit and said control input of said generator circuit being connected to the output of said detecting circuit and respectively activated by said first and second states of said second signal.

4,128,848

AUTOMATIC GHOST-SUPPRESSION SYSTEM

Isao Nakagawa, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 22, 1976, Ser. No. 735,029
Int. Cl.[2] H04N *5/14;* **H04B** *1/10;* **H03K** *1/12*
U.S. Cl. 358—167 **10 Claims**



1. An automatic ghost-suppression system comprising:

variable delay means for delaying a video signal in accordance with a delay time of a ghost;

polarity and gain control means for adjusting the polarity and amplitude of the video signal delayed by said variable delay means;

adder means for adding said video signal not delayed with the output from said polarity and gain control means to suppress the ghost therein;

synchronizing signal separator means for separating a synchronizing signal from said delayed video signal;

gate signal generator means for generating a gate signal in response to said synchronizing signal separated by said synchronizing signal separator means in order to sample any residual ghost in the vertical blanking period out of said video signal produced at the output of said adder means;

detector means for detecting the residual ghost in the vertical blanking period contained in said video signal produced by said adder in response to said gate signal generated by said gate signal generator; and

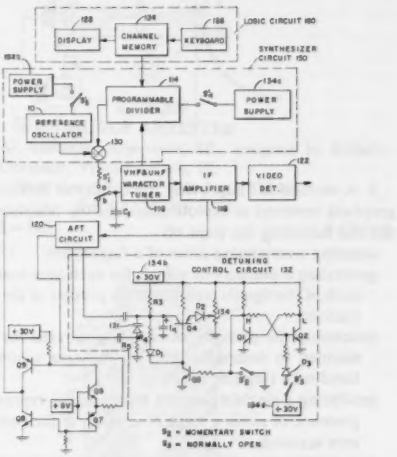
means for controlling the polarity and gain of said polarity and gain control means in response to the output signal of said detector means.

4,128,849

SELECTIVELY COUPLED SYNTHESIZER FOR TUNER OF TV RECEIVER

Dennis W. Rhee, Palatine, Ill., assignor to Admiral Corporation, Schaumburg, Ill.

Filed May 24, 1976, Ser. No. 689,660
Int. Cl.[2] H04N *5/44, 5/50, 5/21, 1/16*
U.S. Cl. 358—191 **11 Claims**



1. In a television receiver, channel selecting apparatus comprising:

(a) tuning means including a varactor tuning element, a local oscillator and a mixer having a first input from said local oscillator and a second input to which an RF video signal is applied;

(b) synthesizer means for providing a first tuning signal said synthesizer means emanating while operative undesireable high frequency radiations, said synthesizer means including:

(1) means for setting a TV channel to be tuned by said tuning means;

(2) variable divider means adapted to be selectively actuated to receive and variably divide the local oscillator output in accordance with a factor corresponding to the channel selected by said setting means;

(3) means for providing a reference signal; and

(4) means for comparing the reference signal with the output of said variable divider means and adapted to be selectively coupled to said tuning means to provide the first tuning signal to be applied thereto;

(c) source means to be selectively coupled to said tuning means for providing a second tuning signal thereto; and

(d) control means operative for a relatively short, initial period for energizing said synthesizer means and for cou-

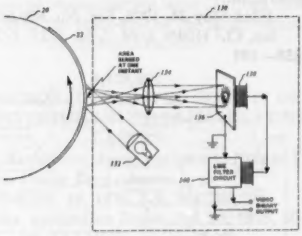
pling said synthesizer means to apply the first tuning signal to said tuning means, and thereafter for de-energizing said variable divider means and said reference signal means of said synthesizer means, whereby the high frequency radiation emanating therefrom is terminated, and decoupling said synthesizer means from said tuning means, while coupling said source means to apply the second tuning signal to said tuning means.

4,128,850

METHOD AND APPARATUS FOR TRANSMITTING FACSIMILES OVER TELEPHONE LINES

Frederic P. Fischer, II, Williamsville, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed May 16, 1977, Ser. No. 797,092
Int. Cl.[2] H04N *1/40*
U.S. Cl. 358—284 **3 Claims**



1. A method for improving the quality of facsimiles of fingerprints received at remote locations via telephone lines or the like including the steps of:

scanning overlapping areas of a fingerprint;

generating a plurality of signals for each area scanned, with each of the signals representing a portion of the area being scanned;

processing the plurality of signals generated for each area scanned to determine whether the area scanned is centered on a ridge or a valley;

producing a single enhanced binary signal representing the presence of either a ridge or a valley at the center of each area scanned;

transmitting the single enhanced binary signal produced for each area scanned;

receiving the transmitted signals; and

processing the received signals to produce a facsimile of the fingerprint.

4,128,851

HAND HELD MAGNETIC CARD ENCODER

Bruce S. Sedley, R.R. 1, Box 96, Koloa, Hi. 96756

Filed Apr. 29, 1977, Ser. No. 792,396
Int. Cl.[2] G11B *5/00, 5/12*
U.S. Cl. 360—4 **2 Claims**

1. A hand held encoder for encoding magnetic card keys and the like comprising:

housing adapted to be manually held and manipulated,

a probe mounted on said housing and having an outer tip adapted to be applied against a surface to be magnetized,

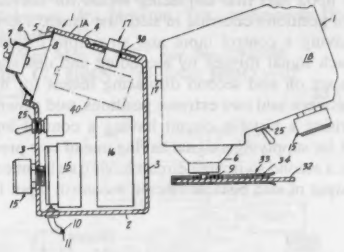
an electrical circuit in said housing and including:

a supply of direct current,

windings around said probe, and

a capacitor,

a switch on said housing for discharging said capacitor through said windings to provide a magnetic field for magnetizing a spot at said surface when said tip is applied thereto,



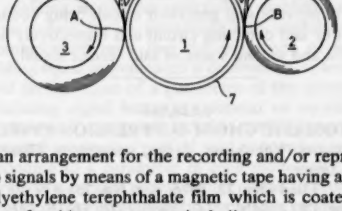
said housing being formed with a portion thereof providing a pistol grip, said switch being secured to said grip and adapted to be actuated by a finger of the user.

4,128,852

TAPE TRANSPORT MECHANISM FOR RECORDING AND PLAYING BACK VIDEO SIGNALS

Werner Senkpiel, Laudenbach; Klaus Schoettle, Heidelberg; Heinrich Wittkamp, Mannheim, and Karl Uhl, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 775,318
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611666
Int. Cl.[2] G11B *15/26, 15/60, 5/78;* B65H *17/32*
U.S. Cl. 360—90 **11 Claims**



1. In an arrangement for the recording and/or reproduction of video signals by means of a magnetic tape having a substrate of a polyethylene terephthalate film which is coated on one side thereof, said arrangement including a transport mechanism of the type which operates according to the contact-winding principle and which consists essentially of a supply and take-up reel of said magnetic tape and at least one rotating capstan wherein the two tape reels are simultaneously driven by virtue of contacting said capstan under pressure, said transport mechanism further including means for generating tape tension in the span of said magnetic tape between the points of contact of said tape reels with said capstan and said tensioned span of magnetic tape being guided relative to and maintained in contact with at least one magnetic recording and/or playback head by means of a tape guiding element having a guide surface which partially surrounds said capstan, the improvement comprising:

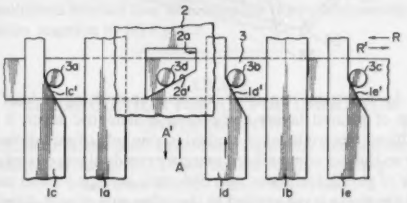
said magnetic tape being positioned with its coated side facing the guide surface of said tape guiding element and having particles within its coating with a Mohs' hardness of greater than 6, thereby imparting at least a slight polishing effect on said guide surface during the tape transport operation, said magnetic tape being exclusively guided by said tape guiding element and coming into contact only with the magnetic recording and/or playback head and the capstan at the points of contact with the supply and

take-up reels within said transport mechanism whereby the substrate surface side of said magnetic tape opposite said coated side will not contact any part of the transport mechanism which could effect the occurrence of slip between such part and the substrate surface during the tape transport operation.

4,128,853
OPERATING MECHANISM OF TAPE RECORDER

Akio Nakazono, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corp., Aichi, Japan

Filed Oct. 7, 1977, Ser. No. 840,278
Claims priority, application Japan, Oct. 20, 1976, 51/140906; Feb. 23, 1977, 52/21687; Feb. 23, 1977, 52/21688
Int. Cl.[2] G11B *21/22, 5/54*
U.S. Cl. 360—105 **3 Claims**



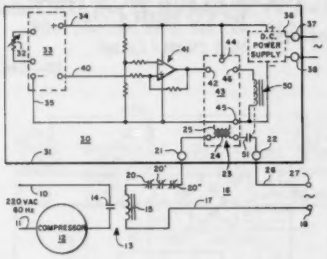
1. An operating mechanism of a tape recorder having at least one of a recording lever and a playback lever, at least one of a pause lever, a cue lever and a review lever, and a subchassis slidably disposed in parallel, spaced apart relationship with said levers and having a head and pinch roller thereon, wherein said subchassis may be advanced by operating one or both of said recording lever and said playback lever to thereby bring the pinch roller and head into engagement with a tape, and wherein said subchassis may be retracted by operating said pause lever, said cue lever or said review lever when said engaged position is brought about, whereby said pinch roller and said head are spaced apart from said tape, characterized in that an edge inclined in one direction is formed on each of said pause lever, said cue lever and said review lever, a through-aperture having an edge inclined in the opposite direction to said one direction is formed on said subchassis, a slider bar is provided on the opposite side from said subchassis and in spaced apart relationship with and transversely of said pause, cue and review levers, and projections engageable with respective ones of said inclined edges are formed on said slider bar whereby movement of any of said levers in one direction causes its inclined edge to cam said slider bar in one direction and the projection thereon in said through-aperture cams said subchassis in a direction to retract said head and roller from said tape.

4,128,854
COMPRESSOR MINIMUM OFF-TIME SYSTEM

Robert T. Ruminsky, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 25, 1977, Ser. No. 844,766
Int. Cl.[2] H02H *7/08*
U.S. Cl. 361—22 **9 Claims**

1. A compressor protection arrangement utilizing a minimum off-time system to insure that a compressor is kept deenergized for a minimum period of time in the event that it becomes deenergized for any reason, including: compressor control switch means including current conducting means adapted to control said compressor in response to condition responsive means; said current conducting means including current transformer means having a first transformer winding connected to sense the flow of current which is controlling said compressor switch means; a second winding of said current transformer means having a voltage output when said first winding has a current flow indicating that said compressor is energized; and minimum off-time delay circuit means connected to said second winding and controlled thereby to initially energize said compressor control switch means upon said condition responsive means requiring the operation of said

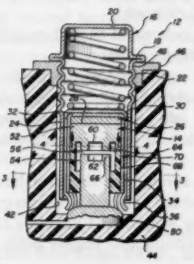


compressor; said minimum off-time circuit means responsive to a loss of said current in said second transformer winding to keep said compressor deenergized for a minimum period of time regardless of the state of said condition responsive means.

4,128,855
SURGE ARRESTER

Alexander G. Gilberts, Algonquin, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Apr. 18, 1977, Ser. No. 788,116
Int. Cl.[2] H02H *3/22*
U.S. Cl. 361—119 **5 Claims**

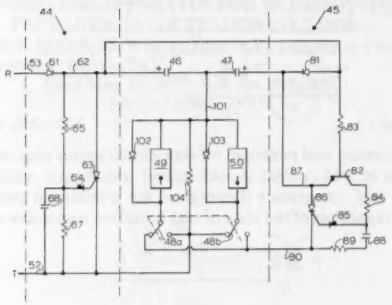


1. In a surge arrester providing overvoltage protection for a communications line or the like, and which comprises a pair of carbon electrodes having transverse ends with an arc gap of air therebetween, insulating and spacing means surrounding the arc gap and maintaining the electrodes in a spaced apart condition, a portion of the insulating and spacing means being radially spaced from said transverse end of each electrode, each of said electrodes having facing valleys at their transverse ends, each valley being surrounded by an annular ridge and with the annular ridges being concentric and facing each other to define said arc gap, the ridges each having a radial dimension that is a minor fractional part of the diameter of the transverse end of the associated electrode, said insulating and spacing means and said electrodes defining an annular cavity that extends axially along a part of the length of each electrode and surrounds said ridges immediately adjacent thereto, said valleys and said annular cavity each being sufficiently wide such that the valleys and the cavity are regions of clearance for collection of electrode material on the ridges and for substantially freely accepting a collection of erupted particles from said electrodes during arc discharge regardless of polarity of the electrodes.

4,128,856
AUTOMATIC RESETTING CONTROL CIRCUIT FOR AIR SWITCH OPERATOR

Donald A. MacLeod, 6815 Ridgewood Dr., Oakland, Calif. 94611

Filed Jul. 29, 1977, Ser. No. 820,039
Int. Cl.[2] H01H *47/32*
U.S. Cl. 361—156 7 Claims



6. An automatic reset circuit for use in conjunction with a remote control system for a valve, a switch and other functionally equivalent devices, characterized by two operating positions and two electrical elements for moving between said positions in opposite directions, said circuit comprising:

an energy storage capacitor connected in series with said two electrical elements;

charging means connected to said capacitor for charging it to a predetermined voltage;

a sensor switch responsive to the position of a said valve, switch and other functionally equivalent devices, and connected to said two electrical elements for reversing connections thereto in accordance with said sensed position;

a normally non-conductive thyristor having an anode and cathode connected between said energy storage capacitor and said sensor switch, and having a control gate;

a normally non-conductive trigger diode connected to said control gate;

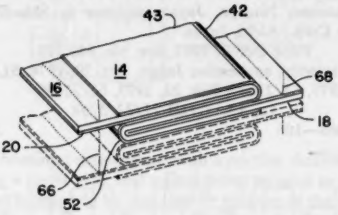
a resistor-capacitor time delay network connected to said trigger diode;

a transistor gate having an emitter and a collector connected between said energy storage capacitor and said time delay network, and having a base connected to said remote control system and responsive to remote actuation of said system to thereupon render said gate conductive, said time delay network to charge from the voltage stored in said energy storage capacitor, whereupon, after the delay of said network, the threshold voltage of said trigger diode is reached, said trigger diode conducts, and said thyristor then conducts to discharge said energy storage capacitor into one of said electrical elements, it being the opposite element to the one operated by the remote control system in the event of the failure of the said valve, switch and other functionally equivalent device to change operating positions in response to actuation of said remote control system thereby resetting said system, and said element being the same element as the one operated by said system when said valves, switch and other functionally equivalent devices has changed operating positions in response to actuation of said remote control system.

4,128,857
PLEATED METALLIZED FILM CAPACITOR WOUND ABOUT ITS CENTER

Charles C. Rayburn, Mt. Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 12, 1977, Ser. No. 814,954
Int. Cl.[2] H01G *1/147*
U.S. Cl. 361—309 9 Claims

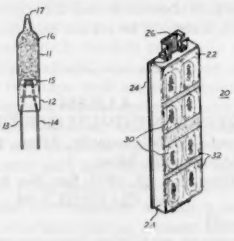


1. An electrical capacitor segment comprising at least one group of pleated layers comprising a dielectric layer, a first metallized electrode layer applied to one side of said dielectric layer so that an unmetallized margin extends along one edge of a pair of parallel edges of said dielectric layer, a second metallized electrode layer applied to the other side of said dielectric layer so that an unmetallized margin area extends along the opposite parallel edge of said dielectric layer, said dielectric layer being pleated an even number of times so that the margin areas of said pleated dielectric strip extend along their respective ends of said pleated dielectric layer beyond the other pleats that extend along the same end as said respective margin areas with said margin areas facing outwardly from adjacent pleats and metallized spray material sprayed against regions of the metallized electrode layers in the vicinity of said margin areas which face inwardly toward adjacent pleats on both of said ends but, without penetration of said spray far enough to contact any of said pleats.

4,128,858
MULTIPLE FLASHLAMP SYSTEM

Vaughn C. Sterling, East Cleveland, and Lewis J. Schupp, Chesterland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,576
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—13 14 Claims



7. A high-voltage activated multiple flashlamp system utilizing a high-voltage low-energy electrical source to ignite the flashlamps in combination with a planar type multiple flashlamp unit comprising a base, a reflector unit mounted on said base having a plurality of outwardly facing reflector cavities disposed in a matrix arrangement and facing outwardly, a plurality of groups of flashlamps, each of said groups including a first group of flashlamps and a last flashlamp connected in series mounted on said base with each one of said lamps being positioned within a respective one of said reflector cavities and

a circuitboard member operatively associated with said lamps to flash the lamps in sequence by providing a series circuit including said lamps adapted to be connected to the energy source, a low resistance switching device connected in series with each lamp of said first group across the energy source and switching to open the circuit upon firing of its associated lamp, said flashlamps each comprising a hermetically sealed light-transmitting envelope, a quantity of filamentary combustible material distributed within said envelope, and flash ignition means within said envelope in the form of a pair of inleads spaced apart with an electrically insulative member and having a mass of primer material connected between said inleads which ignite responsive to application of a high voltage firing pulse thereto and form a conductive residue upon combustion and provide an electrical path to succeeding lamps, said primer material having combustible metal fuel and oxidizer constituents in a ratio of excess combustible metal fuel to oxidizer constituents beyond that necessary for the stoichiometric combustion reaction to take place.

4,128,859

ILLUMINATION DEVICE FOR INDICATOR INSTRUMENTS

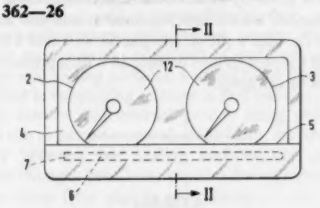
Karl-Heinz Rietmüller, Frankfurt, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany

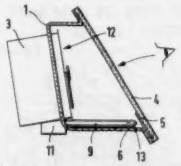
Filed Mar. 16, 1977, Ser. No. 778,030

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611434

Int. Cl.[2] G01D *11/28*

U.S. Cl. 362—26 **13 Claims**





1. A device for the illumination of the instrument dials of at least two indicator instruments which are accommodated in a common housing, particularly of the indicator field of a combination instrument for motor vehicles, comprising

one housing,

at least two indicator instruments having an indicator field mounted in said one housing,

a light source mounted in said housing behind said indicator field,

a single rod-like light transmitting element extending linearly over a substantial part of the length of said housing spaced relative to said indicator field, and said light transmitting element having at least one end portion thereof extending rearwardly and having a free end disposed so as to be illuminated by said light source,

said light transmitting element having a smoothly formed surface throughout and has an outer side along its length facing away from said indicator field,

reflection surface means on said outer side of said light transmitting element for directing light toward said indicator field.

4,128,860

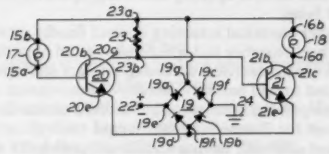
TRUCK MARKER LIGHT

Joseph Spiteri, P.O. Box 71, Harborcreek, Pa. 16421

Filed Nov. 16, 1976, Ser. No. 742,220

Int. Cl.[2] B60Q *1/26*

U.S. Cl. 362—80 **3 Claims**



1. A marker light for trucks, semi-trailers and the like having electrical systems with either positive or negative ground comprising a base having means for mounting the same on a truck, a lens mounted on the base, lamp supporting means, means for mounting the lamp supporting means on the base, said lamp supporting means having first and second lamp sockets for receiving first and second incandescent lamps, a ground terminal adapted to be connected to the truck electrical system ground, a power terminal adapted to be connected to the live terminal of the truck electrical system, a first transistor, a second transistor, a full wave bridge rectifier having its input connected across said power and ground terminals and having its output connected in series through the base and emitter of said first transistor to the first lamp socket and the filament of its lamp and also having its output connected in series through the collector and emitter of said second transistor to the second lamp socket and the filament of its lamp, a connection from the collector of the first transistor to the base of the second transistor for biasing the second transistor off only while the first transistor is on and current is flowing through the first transistor as would be the case when the filament of the first lamp is unbroken, and a bias resistor connected to the base of the second transistor for biasing said second transistor on, the bias from said resistor being overcome by the bias from said first transistor when said first transistor is on and conducting current through the filament of the first lamp.

4,128,861

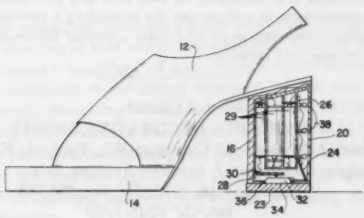
ILLUMINATED SHOE

Akis Pelengaris, 1109 Wm. Floyd Pkwy., Shirley, N.Y. 11967

Filed Mar. 28, 1977, Ser. No. 781,757

Int. Cl.[2] F21V *33/00*

U.S. Cl. 362—103 **3 Claims**



1. An illuminated shoe comprising:

a. a shoe having an upper foot receiving portion and a sole portion including a rear area thereof;

b. a hollow heel defining a chamber therein and including a top, an inner end and a bottom wall, said bottom wall having a central opening, said top wall being fixedly se-

cured on the upper surface thereof to said sole portion adjacent the rear area thereof.

c. an electrical storage battery holder spaced above said bottom wall and secured to any of said other walls and at least one electrical storage battery being removably mounted therein;

d. at least one illuminating lamp coupled to said battery and adapted to be mounted on said battery holder;

e. a resilient pad secured to the outer surface of said bottom wall and having an electrical activating contact penetrating said central opening and being operably connected to said lamp;

f. another electrical actuating contact fixedly secured within the heel chamber and spaced above and opposite said first mentioned electrical actuating contact and operably connected to said battery whereby the movement of said pad when pressed against a rigid surface closes the electrical circuit for illuminating said lamp;

g. a heel side wall having an access opening for the interior of the said chamber;

h. a transparent member opposite said lamp; and

i. means for removable and seal tight affixation of said transparent member over said acess opening.

4,128,862

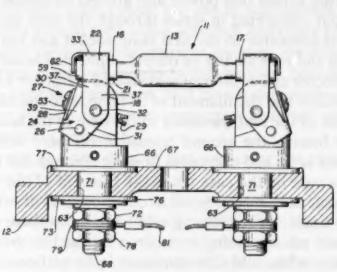
LAMP MOUNTING

Harold R. Thompson, Sierra Madre, Calif., assignor to Soderberg Manufacturing Co., Inc., Walnut, Calif.

Filed Aug. 30, 1976, Ser. No. 718,902

Int. Cl.[2] H05B *33/02*; F21V *21/00*; H01R *33/08*

U.S. Cl. 362—217 **11 Claims**



1. In a lamp mounting having a terminal post providing a rest surface for one side of a lamp terminal and a clamping member formed for engagement with the opposite side of said lamp terminal for clamping the latter to said post surface and a link pivoted to said post and member and means adjusting the rotative position of said link relative to said post to control the clamping pressure on said lamp terminal, the improvement comprising:

a resilient arm mounted on said link and providing the link connection to said means for providing a resiliently yieldable compression of said lamp terminal between said post surface and member.

4,128,863

STOWABLE DECORATIVE LIGHTS

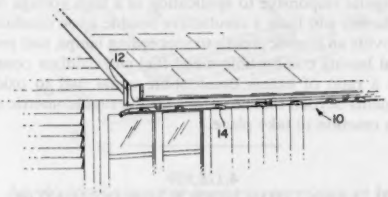
Michael J. Premetz, 12 Covington Rd., Yonkers, N.Y. 10710, assignor to Michael J. Premetz, Yonkers, N.Y.

Filed May 16, 1977, Ser. No. 796,985

Int. Cl.[2] F21S *1/00*

U.S. Cl. 362—249 **3 Claims**

1. A decorative electrical lamp display comprising: a flat plastic web; a first electrical conductor embedded in a first outer edge of said web; a second electrical conductor embedded in a second outer edge of said web; lamp sockets installed at intervals along the flat side of said plastic web sand having electrical connections with said first and second electrical conductors; said lamp sockets housing electric lights and giving the plastic web the appearance of a string of lights; said plastic web being hingeably attached to an overhanging facer board of a building; said web being attached by means of hinges, the first end of each of said hinges is fastened to the back side of said facer board while the second end of each of said hinges is hingeably attached to the plastic web; spaced openings along the web provide attachment points for the second ends of said hinges; spaced slits along the flat plastic web provide attachment means for interference fit with protuberances molded onto the backside of the hinges, allowing the



string of lights to be hidden behind the facer board when not in use, by swinging the plastic web backwards and up into the protuberances through the slits which are periodicallly spaced along the the plastic web to correspond to said mating protuberances on the hinges; when said string of lights is in use the web is held in place by means of at least one holding tab comprising a member with a protuberance at one end adapted to interference fit with a slit on the plastic web and a slit on the opposite end adapted to interference fit with a protuberance on the backside of the hinge.

4,128,864

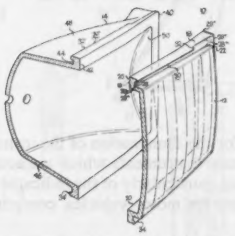
SEALED BEAM LAMP UNIT

Warren T. Brussee, Warren, and William G. Ferris, Chardon, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,432

Int. Cl.[2] F21V *7/00*

U.S. Cl. 362—306 **12 Claims**



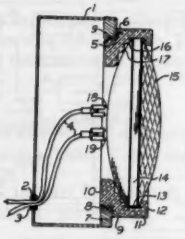
1. A pressed glass lens member for a sealed beam lamp unit which include an inner surface having prism elements to focus light transmitted therethrough including longitudinally extending ribs and an outer sealing rim having front and back sealing surfaces joined by a body section wherein the improvement comprises varying the thickness of said body section so that the thickness of said rim body section is greater in the direction of said longitudinally extending ribs for a circular shaped lens member while the thickness of said rim body section is greater in a direction transverse to the direction of said longitudinally extending ribs for a rectangular shaped lens member.

4,128,865

SHOCK SUPPRESSING RETAINER RING AND GROMMET FOR SEALED BEAM LAMPS

Kenneth L. Johnson, Warren, Pa., assignor to Betts Machine Company, Warren, Pa.

Filed Aug. 8, 1977, Ser. No. 822,528
Int. Cl.[2] F21V 5/04
U.S. Cl. 362—369 1 Claim



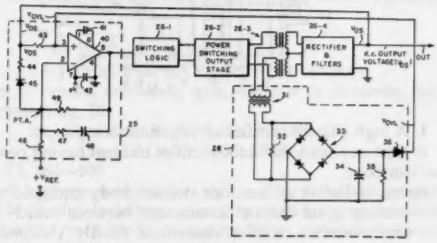
1. A retainer ring and grommet for sealed beam/par lamps, comprising a housing having inner and outer sealing surfaces for surrounding a lamp receiving opening, an annular elastomeric body having its inner end received in said opening with the outer end of said body in overhung relation to said sealing surfaces, the inner end of said body having an integral outwardly projecting O-ring and said inner sealing surface having a groove in sealing engagement with said O-ring, a shoulder on said body engaging said outer sealing surface, said sealing surfaces providing substantially the sole support for said body, an internal groove in the outer end of said body spaced outward from said sealing surfaces, a sealed beam lamp having its rim received in supporting relation in said internal groove, the outermost side of said internal groove being peelable away from said rim to permit removal of the lamp, and the section of said body between said sealing surfaces and said internal groove providing a cantilever support for said lamp for cushioning the lamp from shocks and vibrations and thereby increasing lamp life as compared to a solidly mounted lamp.

4,128,866

POWER SUPPLY WITH CURRENT FOLDBACK

George W. Doerre, Framingham, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Mar. 21, 1977, Ser. No. 779,733
Int. Cl.[2] H02M 3/24
U.S. Cl. 363—15 7 Claims



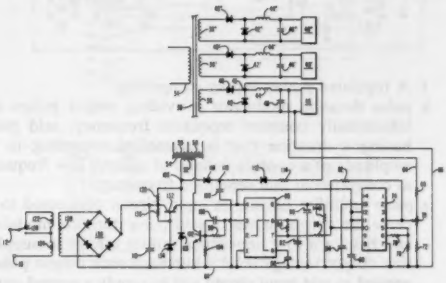
1. In a d.c. switching power supply having a power switcher, a power amplifier coupled to the switcher output, a power transformer coupled to the amplifier, a rectifier and filter coupled to said transformer, and an error amplifier coupled to said power switcher to control same, the improvement of current limit means coupled to said error amplifier for controlling the output error signal thereof upon the detection of a current overload condition in a manner to foldback the power supply output current, said current limit means comprises first means for generating and applying a signal representative of a current overload condition to one input of said error amplifier and said current limit means also comprising second means for altering the input signal applied to another input of said error amplifier.

4,128,867

POWER SUPPLY REGULATION USING SWITCHING TRANSISTORS

Albert M. Heyman, Bedford, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 18, 1976, Ser. No. 733,496
Int. Cl.[2] H02M 5/458
U.S. Cl. 363—21 16 Claims



1. A power supply system for converting standard AC voltage to a low-level DC voltage, said system comprising:

means for converting the standard AC voltage to a first DC voltage level;

means for maintaining said first DC voltage level;

means for transforming the first DC voltage level to the low-level DC voltage said transforming means including a primary winding and at least one secondary winding;

means for applying the first DC voltage level to said means for transforming the first DC voltage level to the low-level DC voltage, said application means comprising:

a first switching means connected to a first terminal of the primary winding of said transforming means,

a second switching means connected to a second terminal of the primary winding of said transforming means, and means for controlling the switching action of said first and second switching means wherein said means comprises:

a control transformer with primary and secondary windings; and

a control means for producing pulse conditions in the primary winding of said control transformer, wherein a pair of secondary windings of said control transformer are each connected to switching terminals within said first and second switching means, wherein a third secondary winding of said control transformer is connected to commonly polarized terminals of said pair of secondary windings of said control transformer and provides a current source to maintain said first and second switching means in conduction,

said control means for producing pulse conditions comprising circuit means for providing a fast turnoff for said first and second switching means, said circuit means being coupled to the positive terminal of said control transformer primary winding and a first terminal and a second terminal of at least one secondary winding of said transformer means.

4,128,868

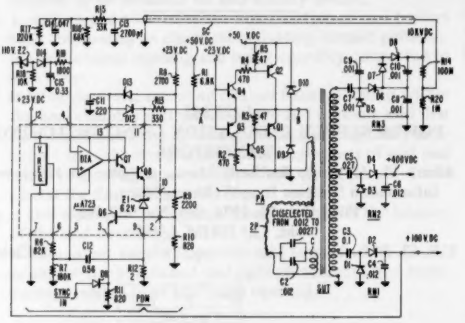
D-C CONVERTER USING PULSED RESONANT CIRCUIT

Edward B. Gamble, Granada Hills, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,751

Int. Cl.[2] H02M *3/335*

U.S. Cl. 363—26 **4 Claims**



1. A regulated power supply comprising:

a pulse duration modulator providing output pulses at a substantially constant repetition frequency, said pulses having a duration that is controlled according to the amplitude of a control voltage of relative low frequency as compared to said repetition frequency;

a pulse amplifier having an input circuit connected to receive the output pulses of said pulse duration modulator and having a low impedance output circuit to supply a first output voltage level while each such output pulse is applied to said input circuit and to supply a second output voltage level during each interval between such output pulses;

a step-up transformer having a primary winding and a secondary winding;

capacitance connected in a resonant combination with said primary winding, said resonant combination being connected across the output circuit of said pulse amplifier, and presenting high Q due to the low impedance thereof, the values of said capacitance and the inductance of said primary winding being chosen so the resonant frequency is substantially equal to an integral multiple, one or more, of the constant repetition frequency whereby the voltage being developed across said primary winding in response to the peak output voltage level of said pulse amplifier is multiplied up by said high Q value;

rectifying means for developing a rectified voltage responsive to the voltage appearing across the secondary winding of said step-up transformer; and

means for applying a portion of said rectified voltage as said control voltage to said pulse duration modulator.

4,128,869

PHASE CONTROL ARRANGEMENT OF VALVE CONVERTER

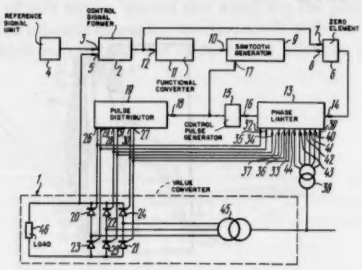
Eduard S. Ermolovich, poselok Krasnaya Gorka, ulitsa Zavodskaya, 2, kv. 4, Istra Moskovskoi oblasti, and Mikhail V. Olshvang, Galyanovo, korpus 13a, kv. 63, Moscow, both of U.S.S.R.

Filed Jan. 12, 1977, Ser. No. 758,689

Int. Cl.[2] H02M *7/155*

U.S. Cl. 363—87 **4 Claims**

1. A phase control arrangement of a valve converter comprising: a reference signal unit having an output; a control pulse former having a first input connected to said output of said reference signal unit, a second input electrically coupled to the valve converter and an output; a sawtooth generator having a first input connected to said output of said control signal former, a second input designed for transmitting a signal modifying the amplitude of the sawtooth signal, and an output; a zero element having a first input connected to said output of said control signal former, a second input connected to said output of said sawtooth generator and an output; a phase limiter having an input connected to said output of the zero element and an output; a control pulse generator having an input



connected to said output of said phase limiter and an output connected to said second input of said sawtooth generator; a pulse distributor for distributing pulses among valves of the valve converter having an input connected to said output of said control pulse generator and outputs connected to respective valves, the number of outputs corresponding to the number of valves of said valve converter.

4,128,870

HIGH CURRENT-RECTIFIER ARRANGEMENT

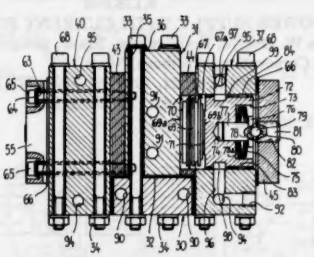
Johannes F. Knobloch, Watt-Regensdorf, and Ernst Brunner, Zürich, both of Switzerland, assignors to H.A. Schlatter AG, Schlieren, Switzerland

Filed Sep. 6, 1977, Ser. No. 831,086

Claims priority, application Switzerland, Sep. 29, 1976, 12295/76

Int. Cl.[2] H02M *7/06*

U.S. Cl. 363—141 **9 Claims**



1. A high current-rectifier arrangement comprising:

at least one semiconductor-rectifier element having contact surfaces;

means including at least one contact body equipped with cooling agent-channel means and between which said semiconductor-rectifier element is fixedly clamped by means of its contact surfaces;

means mounting said contact body to be movable;

means for pre-biasing under spring force said movable contact body;

said mounting means including a connection element;

a connection line for electrically connecting the movable contact body with said connection element;

said movable contact body possessing a substantially piston-like structure;

said connection element being provided with a substantially cylinder-shaped compartment having an inner wall and

within which there is movably arranged the piston-like, movable contact body with radial play;

said movable contact body being surrounded at its periphery by said connection line which bridges the radial play to the inner wall of said compartment;

said cooling agent-channel means of said movable contact body being constructed to be offset at the periphery thereof with regard to said connection line;

said connection element being provided with cooling agent-channels; and

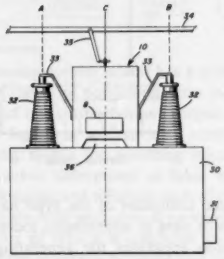
means for sealingly connecting the cooling agent-channel means of said movable contact body with the cooling agent-channels of the connection element.

4,128,871

HIGH VOLTAGE DC POWER SUPPLY

Sammy Y. Murad, Fountain Valley, Calif., assignor to Wahlco Inc., Santa Ana, Calif.

Filed Jun. 10, 1977, Ser. No. 805,250
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—144 **13 Claims**



1. A high voltage direct current power supply comprising: a transformer having a metal housing and first and second high voltage output bushings; tank means for retaining a bath of insulating liquid; said tank means formed of an electrically nonconductive material; mounting means for supporting said tank means on said transformer housing intermediate said first and second bushings; a rectifier assembly mounted in said tank means so as to be submersible in said bath; said rectifier assembly having first and second AC input terminals and first and second DC output terminals; input connecting means for electrically connecting said first and second bushiongs to said first and second AC input terminals respectively; and said first DC output terminal being grounded and said second DC output terminal being generally positioned equidistant from said first and second bushings and above said first and second bushings.

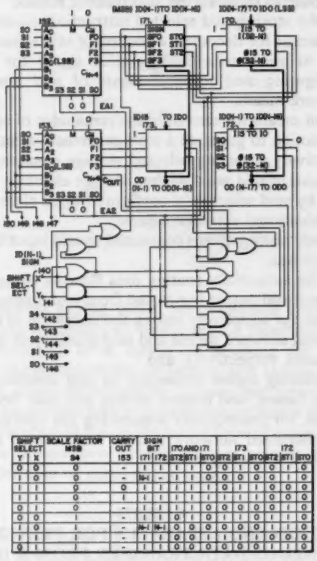
4,128,872

HIGH SPEED DATA SHIFTER ARRAY

Jerry E. Prioste, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 20, 1977, Ser. No. 808,221
Int. Cl.[2] G11C *19/00*; G06F *1/00*
U.S. Cl. 364—900 **15 Claims**

1. A high speed digital data shifter array for shifting digital data in parallel including a plurality of 16 bit programmable data shifters each having a sign bit input, a plurality of scale factor inputs, and a plurality of shift function command inputs, the array comprising: a predetermined number of the sixteen bit programmable data shifters arranged to receive input data and to provide output data, each of the programmable data shifters providing at least rotate right, rotate left, arithmetic shift right, arithmetic shift left, shift left using two's complements, and shift right using two's complement operations in response to input commands; a plurality of scale factor inputs coupled to the plurality of scale factor inputs of the programmable data shifters for selecting the number of positions data is to be shifted by the 16 bit programmable data shifter; and a plurality of logic gates for receiving and decoding input commands for the shifter array, the plurality of logic gates having outputs to provide decoded control commands which are coupled to the plurality of shift function command inputs of



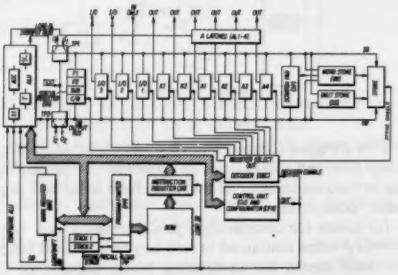
the predetermined number of sixteen bit programmable shifters so that the shifter array can shift and can rotate the input data in response to the input commands and can place the sign bit at the outputs in response to a predetermined input command.

4,128,873

STRUCTURE FOR AN EASILY TESTABLE SINGLE CHIP CALCULATOR/CONTROLLER

Sylves L. Lamiaux, Ancretieville St-Victor, France, assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 20, 1977, Ser. No. 834,929
Int. Cl.[2] G06F *11/00, 7/00*
U.S. Cl. 364—200 **4 Claims**



1. A testing structure for a microprocessor comprising:

combinational network means, said combinational network means comprising a plurality of logic elements wherein said logic elements are capable of being selectively configured in a plurality of combinations;

a plurality of data storage elements for containing data, said data storage elements being connected in parallel with

said combinational network means by means of an input bus and an output bus;

program storage means, said program storage means containing a plurality of instructions;

control means for controlling instruction execution;

means for selecting one of said plurality of instructions in response to signals from said control means;

means for storing said selected instruction;

a first means for decoding a portion of said selected instruction to generate a configuration signal for selectively configuring said logic elements of said combinational network means;

a second means for decoding the remainder of said selected instruction to generate a storage element select signal for selectively actuating selected storage elements, said data contents of said selected data storage elements being modified by said selectively configured logic elements of said combinational network means;

diagnostic testing means connected to said input bus and said output bus;

means for selectively routing data flowing along said input bus and said output bus to and from said diagnostic testing means, for selectively testing the operation of said combinational network means and said plurality of data storage elements, respectively; and

data clocking means connected to said combinational network means, said control means, and said first decoding means, for controllably sequencing the operation of said combinational network means, said control means, and said first decoding means.

4,128,874

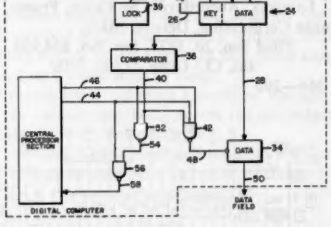
METHOD AND APPARATUS FOR PREVENTING ERRONEOUS DATA TRANSFER FROM A DIGITAL COMPUTER

Jerry H. Pertl, Bloomington, and Howard A. Koehler, Minneapolis, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 686,977, May 17, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,699

Int. Cl.[2] G06F *11/00*

U.S. Cl. 364—200 **8 Claims**



1. In a digital computer having an output word consisting of a key field and a data field, an apparatus for protecting against the erroneous transfer of said data field from said digital computer, comprising:

(a) means for comparing a predetermined lock value with a key value contained in said key field of said output word, said means for comparing being capable of indicating either a first or second condition depending upon the comparison of said lock value and said key value;

(b) means for tranferring said data field of said output word from said digital computer; and

(c) means for inhibiting said transfer of said data field of said output word when said means for comparing indicates said first condition but not inhibiting said transfer when said means for comparing indicates said second condition.

4,128,875

OPTIONAL VIRTUAL MEMORY SYSTEM

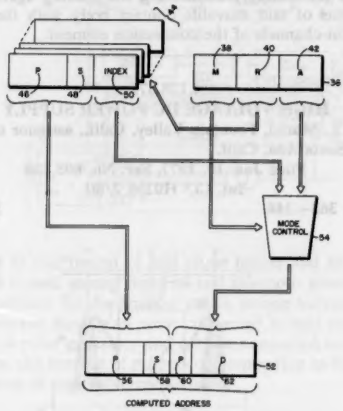
Kenneth J. Thurber, Edina, Minn., and Jon C. Strauss, Wayne, Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,789

Int. Cl.[2] G06F *3/00*

U.S. Cl. 364—200 **14 Claims**

ADDRESS COMPUTATION



1. In a digital computer of the type having a memory for storing words of data at addressable locations therein, an address generation apparatus for generating a single memory address from a software specified address consisting of a register identifier and offset identifier and from predetermined state information, comprising:

a first register for holding said software specified address including said register identifier and said offset identifier;

a first set of registers selectable from the portion of said first register containing said register identifier, each of said first set of registers containing said predetermined state information consisting of process, segment and pointer identifiers;

a first selector means coupled to said first register and to said first set of registers to receive said register identifier for selecting one of said first set of registers;

a second register, a portion of which is coupled to the portion of said first register containing said offset identifier and another portion of which is coupled to receive the portion of the selected one of said first set of registers containing said process and segment identifiers, said second register for holding at least four fields adapted to specify process and segment identifiers obtained directly from said process and segment identifiers of the selected one of said first set of registers and to further specify page and displacement identifiers obtained by partitioning said offset identifier from said first register;

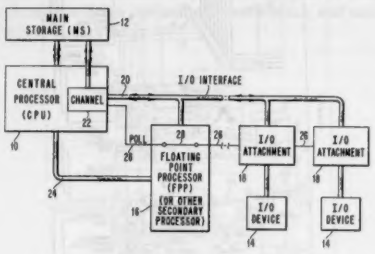
storage means including a plurality of memory locations, each holding a frame identifier, said storage means being directly addressable by the concatenation of said pointer identifier from the selected one of said first set of registers and said segment and page identifiers from said second register; and

a third register, a portion of which is coupled to said storage means for receiving a selected frame identifier from said storage means and another portion of which is coupled to the portion of said second register containing said displacement identifier, said third register thereby said single memory address obtained by concatenating said frame identifier with said displacement identifier.

4,128,876
SYNCHRONOUS MICROCODE GENERATED INTERFACE FOR SYSTEM OF MICROCODED DATA PROCESSORS

Richard N. Ames; Dick K. Hardin; Joel C. Leininger, and George P. Taylor, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1977, Ser. No. 792,085
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—200 14 Claims



1. In a data processing system which has a central processor associated with a plurality of peripheral units including a secondary processor and one or more input/output devices, each of said processors having a microcoded control store and associated addressing means for selecting microwords from said store in a sequence determined at least in part by the operation to be performed, and wherein each of said peripheral units may communicate with said central processor through an interface at least part of which is common to all peripheral units in the system, the interface between said central processor and said secondary processor further including improved features whereby said processors can be synchronously coupled to each other for the joint execution of interrelated procedures and whereby said secondary processor also is able to share the common portion of said interface with the other peripheral units for transferring data to and from said central processor, said improved features comprising:

common timing control means for clocking the respective sequences in which stored microwords are utilized by both of said processors when they are operating conjointly,

a first signal line extending between said processors,

first control means in said central processor operable to place an enabling signal upon said first signal line when communication is to be established between said processors,

a second signal line extending between said processors,

second control means in said secondary processor responsive to an enabling signal on said first signal line when an operation specified by said central processor is being delegated to said secondary processor for placing on said second signal line a signal denoting that said secondary processor is installed and able to execute said operation,

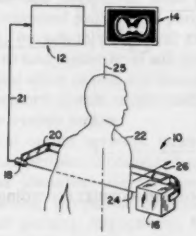
third control means in said central processor responsive to the operation-installed signal on said second signal line for conditioning said common interface to function in a cycle steal mode for transferring data between any of said input-/output devices and said central processor while said secondary processor is performing the operation delegated to it by said central processor, and

fourth control means in said central processor responsive to termination of the operation-installed signal on said second signal line when said secondary processor has substantially completed its performance of the selected operation for conditioning said common interface to function in an interprocessor mode permitting data transfer between said secondary processor and said central processor.

4,128,877
METHOD OF OBTAINING A UNIQUELY DETERMINED CROSS-SECTIONAL RECONSTRUCTION FROM X-RAY PROJECTIONS

Myron B. Katz, 1633 First St., Apt. A, New Orleans, La. 70130

Filed Mar. 31, 1977, Ser. No. 783,083
Int. Cl.[2] G01N *23/08;* G06F *15/42*
U.S. Cl. 364—414 4 Claims



1. In a system having means for projecting a plurality of parallel X-ray images of an object onto a recording medium having a resolution of w, means for sampling the recording medium to obtain therefrom projection data representative of said images, means responsive to the sampling means for combining said projection data to generate therefrom a reconstruction representative of the object in the form of a square of side L, grid-like presentation divided into n^2 smaller squares, n being smaller than or equal to the quantity

$$\max\left(\sum_{j=1}^{m}|p_j|,\ \sum_{j=1}^{m}|q_j|\right)$$

where p_j and q_j are relatively prime integers, m is the number of X-ray images obtained, and $0 \leqq |p|, |q| \leqq n$, and means responsive to the combining means for displaying the presentation, the method of obtaining the X-ray images so that the object reconstructed will be uniquely determined, the method comprising:

orienting the X-ray projecting means about an axis through the object at each one of a number of predetermined angles $\{\theta_1, \theta_2, \ldots, \theta_m\}$ and projecting an X-ray image of the object at each orientation, each of the angles $\{\theta_1, \theta_2, \ldots, \theta_m\}$ being selected from a set of angles $\bar{\theta}(n)$ with elements of the form $\theta = \arctan p/q$, orientation of the X-ray projecting means at each of the angles $\{\theta_1, \theta_2, \ldots, \theta_m\}$ providing resolution in the projection data that is at least as large or larger than w and defined by L/n times the quantity

$$(p^2 + q^2)^{-\frac{1}{2}}.$$

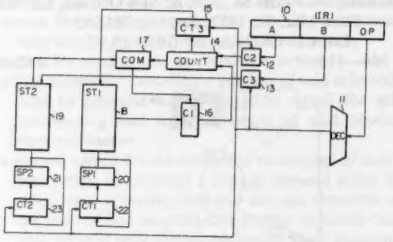
4,128,878
SYSTEM FOR EXCUTING A PROGRAM-CALL INSTRUCTION IN A COMPUTER

Hiroshi Yasuhara, and Seiki Saito, both of Tokyo, Japan, assignors to Oki Electric Industry, Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,333
Claims priority, application Japan, Jul. 20, 1976, 51-85612
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—200 4 Claims

1. A computer system for excuting a program call instruction which facilitates the common use of a common program in a plurality of main programs comprising a first push down stack for storing the next address of the address of the program call instruction, a second push down stack for storing the final address of the common program, a program counter for indicating the current excuted address, being switched to the start address of the common program upon decoding the program call instruction, a comparator for comparing the output of the

second push down stack and the content of the program counter, and means for transferring the output of the first push



down stack to said program counter according to the output of said comparator.

4,128,879

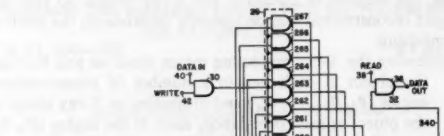
RECIRCULATING MEMORY WITH PLURAL INPUT-OUTPUT TAPS

Harry N. Gardner, Colorado Springs, Colo., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 709,750, Jul. 29, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,260

Int. Cl.[2] G11C *21/00, 19/28*

U.S. Cl. 365—73 **16 Claims**



1. A memory comprising:

memory means including a plurality of sequentially coupled storage cells for recirculating data, one of said storage cells being a reference storage cell;

address means for addressing any particular bit of data recirculating in said memory means;

first means coupled to said address means and said memory means for counting the number of said memory cells through which said addressed bit has shifted relative to said reference storage cell and combining said number with an address representing the location of the storage cell where said addressed bit was initially stored to produce an internal address corresponding to the actual location of said addressed bit of recirculating data; and

decode means coupled to said plurality of storage cells and to said first means for selecting said actual location.

4,128,880

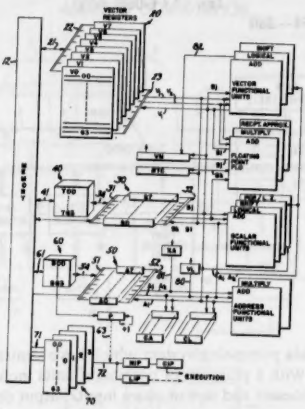
COMPUTER VECTOR REGISTER PROCESSING

Seymour R. Cray, Jr., Lilydale, Minn., assignor to Cray Research, Inc., Chippewa Falls, Wis.

Filed Jun. 30, 1976, Ser. No. 701,119

Int. Cl.[2] G06F *9/18*

U.S. Cl. 364—200 **12 Claims**



1. Vector processing apparatus for a computer having a main memory, comprising:

a plurality of vector registers each including means for holding a plurality of elements of an ordered set of data;

at least one arithmetic or logical functional unit having an input for receiving operands and an output for delivering results, said functional unit including segmented means for holding data for operations not yet completed while receiving operands for successive operations;

path select means associated with said vector registers and responsive to program instructions for selectively connecting individual vector registers for transmission of data to or from said main memory, and for selectively connecting individual vector registers for transmitting data as operands to a functional unit and for receiving results from a functional unit; and

control means associated with said vector registers and responsive to program instructions, said control means being operative in conjunction with a vector register selected as an operand register in a vector processing operation to successively transmit the elements of the ordered set of data from the vector register to a functional unit on successive clock periods, said control means being operative in conjunction with a vector register selected as a result register in a vector processing operation to receive and store successive results transmitted from a functional unit as elements of an ordered set of data representing a result vector, on successive clock periods following delivery of the first result from the functional unit.

4,128,881

SHARED MEMORY ACCESS CONTROL SYSTEM FOR A MULTIPROCESSOR SYSTEM

Mitsuru Yamamoto, Kawasaki; Jun Arai, Yokosuka; Takao Isogawa, and Isamu Hasebe, both of Yokohama, all of Japan, assignors to Panafacom Limited, Kawasaki, Japan

Filed Feb. 18, 1976, Ser. No. 658,853

Claims priority, application Japan, Feb. 20, 1975, 50-21250

Int. Cl.[2] G06F *9/20, 13/00*

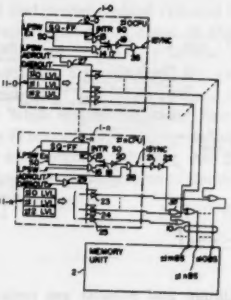
U.S. Cl. 364—200 **10 Claims**

1. In a multiprocessor system having a plurality of processors, each of which has a normal operational state and certain special condition operational states, said system including a

common memory unit and said plurality of processors; a shared memory unit access control system comprising:

a fixed address supply source, one in each processor, for generating address information of multiple bits and for addressing and accessing said common memory unit in accordance therewith, said address information generated by each said fixed address supply source in each of said respective processors being identical, and

a sequential state indicate signal generator, one in each processor, for producing an output signal of a single bit which selectively assumes logic "1" or "0" values in accordance with a predetermined sequence when one of said certain special condition operational states exists; and said system further comprising:



fixing means external to at least each of said processors except for one and responsive to said output signal for fixing at least one bit of said multiple bits, provided by said fixed address supply source of said at least each of said processors except for one, to the logic "1" or "0" values of the output signal produced by said sequential state indicate signal generator, said at least one bit of each respective one of said at least each of said processors except for one being respectively different in identity in relation to said multiple bits, whereby to uniquely alter said address information produced by said fixed address supply source of said at least each of said processors except for one during said special condition operational states.

4,128,882

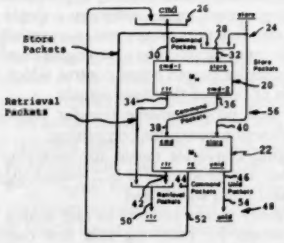
PACKET MEMORY SYSTEM WITH HIERARCHICAL STRUCTURE

Jack B. Dennis, Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 19, 1976, Ser. No. 716,071

Int. Cl.[2] G06F *13/00*

U.S. Cl. 364—200 **17 Claims**



1. A memory system for a digital data processor, said memory system comprising:

(a) at least a higher level sub-memory system means containing higher level records representing relatively active items of information, said higher level sub-memory system means capable of concurrent processing of a plurality of memory transactions;

(b) at least a lower level sub-memory system means containing lower level records representing relatively inactive items of information, said lower level sub-memory means capable of concurrently processing a plurality of memory transactions;

(c) a peripheral input network means for peripheral command signals and peripheral store signals representing peripheral command packets and peripheral store packets, respectively, by which peripheral command signals are transmitted to said higher level sub-memory system means and peripheral store signals are transmitted to said higher level sub-memory system means and to said lower level sub-memory system means;

(d) a peripheral output network means for peripheral retrieval signals, peripheral command signals and peripheral unid (unique identifier) signals representing peripheral retrieval packets, peripheral command packets and peripheral unid packets, respectively, by which peripheral retrieval signals and peripheral command signals are transmitted from said lower level sub-memory system means and to said upper level sub-memory system means and peripheral unid signals are transmitted from said lower level sub-memory system means;

(e) an internal output network means for internal retrieval signals and internal command signals representing internal retireval packets and internal command packets, by which said internal retrieval signals and said internal command signals are transmitted from said higher level sub-memory system means;

(f) an internal input network means for internal command signals representing internal command packets by which said internal command signals are transmitted to said lower level sub-memory system means;

(g) said signals representing peripheral command packets and said signals representing internal command packets specifying whether a store operation or a retrieval operation is to be performed on said records representing items of information or specifying administrative transactions to be performed on said records representing items of information;

(h) said signals representing peripheral store packets and said signals representing internal store packets specifying data items to be stored in said records representing items of information;

(i) said signals representing peripheral retrieval packets and said signals representing internal retrieval packets specifying data items retrieved from said records representing items of information; and

(j) said signals representing peripheral unid packets specifying said records representing items of information and uniquely designating one of said lower level records or one of said higher level records.

4,128,883

SHARED BUSY MEANS IN A COMMON BUS ENVIRONMENT

Jack R. Duke, San Marcos; Niranjan S. Shah, Escondido, and William C. Woolf, San Diego, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 30, 1977, Ser. No. 838,280

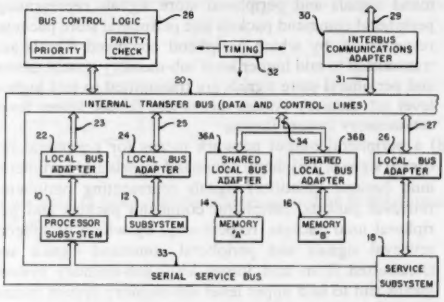
Int. Cl.[2] G06F *3/04*

U.S. Cl. 364—200 **8 Claims**

1. In a data processing system wherein each of a group of data handling subsystems communicates with other subsystems of the group by means of an internal transfer bus having a number of bus ports connected to the subsystems by local bus adapters, and wherein each bus port has a single busy line uniquely assigned thereto for signalling busy or available states of the adapter at such bus port to other adapters at other bus ports, and for signalling an incoming message from one of the

other adapters to the adapter at such bus port, the improvement comprising:

first and second shared local bus adapter means for respectively connecting first and second ones of said subsystems in common to one of said ports, the single busy line of such port being a common busy line connected and assigned to both said shared adapter means for signalling states thereof, said shared adapter means including,



means for employing said common busy line to signal to other subsystems on said bus a busy state of both of said first and second subsystems, and

means responsive to a signal addressed to said first subsystem for signalling to other subsystems on said bus a busy state of said first subsystem concurrent with an available state of said second subsystem.

4,128,884

METHODS AND APPARATUS FOR ANALYZING FREQUENCY DISTRIBUTIONS

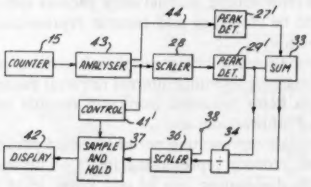
John M. England, Chipperfield, England, assignor to National Research Development Corporation, London, England

Filed Feb. 20, 1976, Ser. No. 659,632

Claims priority, application United Kingdom, Feb. 28, 1975, 08473/75

Int. Cl.[2] **G01N** *33/16*

U.S. Cl. 364—416 **16 Claims**



10. Apparatus for determining the proportion of a first type of cell in a blood sample containing cells of the first type and a second type, when the sample has been prepared in such a way that the volumes of the two types of cells form log-normal sub-distributions in a distribution of cell frequency versus cell volume including a counter for processing blood samples and providing a signal for each cell representative of the volume of that cell, and an analyser for determining the frequency of cells within each of a number of linearly divided volume intervals, the analyser providing, in operation, two signals one representative of frequency within an interval and the other representative of mean volume of the interval, calculating means, coupled to receive the said two signals, for providing an output signal representative of $K'M'/K'M' + L'$ where K' is the ratio of the standard deviation of the logarithms of volumes of the first type of cells divided by the standard deviation of the logarithms of the volumes of the second type of cells; M' is the peak of the product frequency of the first type of cells in a volume interval multiplied by mean volume for that interval and L' is the peak of the product frequency of second type of cells in a volume interval multiplied by mean volume for that interval, and means for allowing for any overlap between the sub-distributions in providing a final output signal for the apparatus.

4,128,885

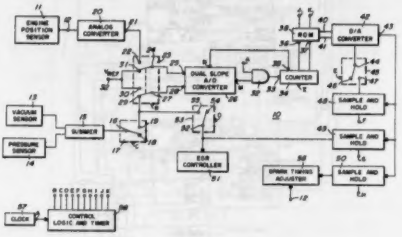
DIGITAL CIRCUITRY FOR SPARK TIMING AND EXHAUST GAS RECIRCULATION CONTROL

Robert J. Valek, Wheaton, and Todd H. Gartner, Elmhurst, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 18, 1977, Ser. No. 798,067

Int. Cl.[2] **F02M** *25/06;* **F02D** *5/00*

U.S. Cl. 364—424 **22 Claims**



1. A spark timing and exhaust gas recirculation control system for an internal combustion engine, said system including:

a signal processing circuit for developing an output which is a complex function of two variable input signals representing different engine conditions, said circuit comprising:

programmable transfer function means for receiving an input signal and producing an output signal having a selectable predetermined relationship to the input signal;

means coupled to said programmable transfer function means for supplying a first analog input signal related to a first engine condition to said transfer function means while selecting a first transfer relationship therefor;

first storage means coupled to said transfer function means for storing a quantity related to the output of said transfer function means produced in response to said first input signal;

said supplying and selecting means including circuitry for supplying a second analog input signal related to a second engine condition to said transfer function means, after said first input signal, while selecting a second relationship for said transfer function means; and

means coupled to said first storage means for multiplying the output of said programmable transfer function means produced in response to said second input signal by a factor related to said stored quantity to produce a complex output analog control signal, whereby a single programmable transfer function means can sequentially process two variable input signals related to engine conditions and develop a complex output signal control which is a product function of both of the input signals;

and wherein said programmable transfer function means includes a function generator comprising:

analog to digital converter means for receiving an input analog signal and producing a first output digital signal related to said input signal; and

read only memory means coupled to said analog to digital converter means for receiving said first output digital signal as an input and producing a second output digital signal having a selectable predetermined functional relationship with respect to said first output digital signal;

and wherein said multiplying means includes:

digital to analog converter means coupled between said read only memory means and said storage means for receiving said second digital output signal and producing a first

analog output signal related to said second digital output signal;

and wherein said analog to digital (A/D) converter means comprises:

at least one capacitor:

first means coupled to said capacitor for setting the charge on said capacitor to a first predetermined charge level;

second means coupled to said capacitor for subsequently altering the charge on said capacitor from said first predetermined charge level at a predetermined rate;

means coupled to said capacitor for comparing the charge on said capacitor to a predetermined reference level and producing a digital signal related to the duration of time between the time of starting to alter the charge on said capacitor at said predetermined rate and the time that the charge on said capacitor is equal to the predetermined reference level; and

means for sequentially activating said first and second means and maintaining said first predetermined charge level at a fixed value while determining said first predetermined rate directly in accordance with the variable magnitude of one of said input signals, whereby said produced digital signal is a function of the inverse of the magnitude of said one of said input signals.

4,128,886

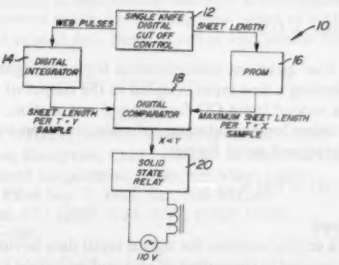
MAXIMUM WEB SPEED MONITOR

Allan B. Woolston, Wynnewood, Pa., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Mar. 15, 1977, Ser. No. 777,973

Int. Cl.[2] G05B *5/00*; B26D *5/38*

U.S. Cl. 364—475 **8 Claims**



1. A maximum web speed monitor for limiting the speed of a moving web which is cut into sheets by a knife in a cut-off machine having means for providing a signal indicative of the actual length of a sheet cut by the knife from the moving web based on the speed of the knife and means for providing a signal indicative of the speed of the web, comprising:

first means for repetitively providing a sample signal indicative of the actual speed of the moving web during a preselected sampling interval based on said web speed signal,

second programmable means addressable by said actual sheet length signal for storing information representative of the maximum permissible speed of the web as a function of sheet length based on said sampling interval, and

comparator means operatively associated with said first and second means for comparing said stored maximum permissible speed information to said sample signal substantially instantaneously with the production of said actual sheet length signal and for providing a signal indicative of whether the web speed exceeds a maximum permissible speed.

4,128,887

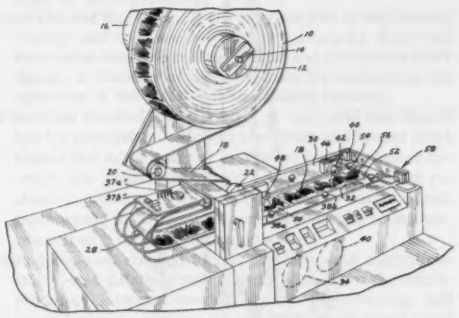
MICROPROCESSOR CONTROLLED PHOTOGRAPHIC PAPER CUTTER

Gerald R. Strunc, Maple Grove, and Francis M. Laciak, Brooklyn Park, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Sep. 29, 1977, Ser. No. 838,064

Int. Cl.[2] B26D *5/38*

U.S. Cl. 364—475 **25 Claims**



1. A photographic strip advancement system comprising:

stepper motor means for driving, by steps, a strip of photographic material;

stepper motor control means for causing, in response to control signals, the stepper motor means to take steps;

step status means for supplying a step status signal indicative of whether the stepper motor has taken a step;

storage means for storing control information, the control information including a stored program for directing control functions to be performed; and

programmable digital processor means for receiving the step status signal and supplying the control signals to the stepper motor control means as a function of the step status signal and the control information.

4,128,888

VELOCITY CONTROL ARRANGEMENT FOR A COMPUTER-CONTROLLED OIL DRILLING RIG

Loren B. Sheldon, Houston, Tex.; James R. Tomashek, Wood Dale, and Donald H. Ward, Glen Ellyn, both of Ill., assignors to BJ-Hughes Inc., Houston, Tex.

Filed Mar. 15, 1977, Ser. No. 777,677

Int. Cl.[2] E21B *19/00*; G06F *15/20*

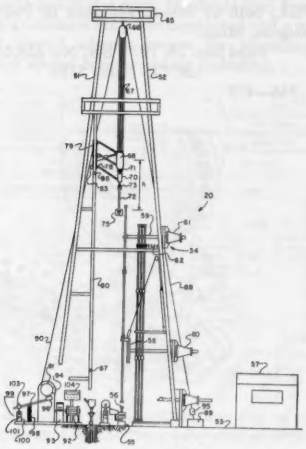
U.S. Cl. 364—565 **10 Claims**

1. In an oil drilling rig having a traveling block vertically upwardly and vertically downwardly movable and having transducer means for generating an electrical signal representative of the actual direction of motion of the traveling block and an electrical signal representative of the actual block velocity, wherein the improvement comprises

first means for comparing the signal representative of the actual velocity of the block with a signal representative of a predetermined maximum velocity and for outputting a first alarm signal indicative of the actual velocity being greater than the predetermined maximum velocity; and,

second means for comparing the signal representative of the

actual direction of motion of the block with a signal representative of a predetermined direction of motion and for



outputting a second alarm signal if the actual direction of the block deviates from the predetermined direction.

4,128,889

PEN TYPE ELECTRONIC DIGITAL CALCULATOR

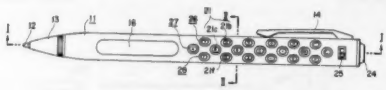
Shin Ojima, Yao; Kazuhiko Ohgami, Higashiosaka; Kazutaka Watanabe, Yao; Masaru Nohara, Yao, and Kenji Yamamoto, Yao, all of Japan, assignors to Hoshidenki-Seizo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 24, 1977, Ser. No. 809,728

Claims priority, application Japan, Jun. 28, 1976, 51-85422[U]; Jan. 14, 1977, 52-3253[U]; Jan. 14, 1977, 52-3254[U]

Int. Cl.[2] **G06F** *3/02, 15/02*

U.S. Cl. 364—705 **5 Claims**



1. In a pen type electronic digital calculator of the type comprising:

a tubular body;

a display element for displaying a calculation result, the display element being disposed in one of half portions of the tubular body and arranged to be viewed from the outside through a display window formed in the outer peripheral surface of the tubular body in its lengthwise direction;

a semiconductor integrated circuit element for calculation mounted in the tubular body for supplying the display element with a signal indicative of the result of a calculation;

a battery mounted in the tubular body for supplying operating electric power to the display element and the semiconductor integrated circuit element; and

a keyboard switch having a plurality of keys for inputting numerical value and function information to the semiconductor integrated circuit element for calculation, the keyboard switch being mounted in the other half portion of the tubular body and disposed on the line of extension of the display element;

the improvement wherein the keys are each adapted to input only one piece of information, the keys of said keyboard switch being arranged in three adjacent rows in the lengthwise direction of the tubular body, the keys of each of said rows being disposed in staggered relation to the keys of an adjacent one of said rows, the spacing between adjacent keys in each of said rows being greater than the length of each of said keys along said row, said tubular body being formed with a plurality of depressed recesses in its outer surface, each of the keys being disposed within one of said recesses respectively with the outer peripheral surface of the key being spaced from the peripheral walls of its associated recess, and said keys being so dimensioned and so positioned within their respective recesses that when the tubular body is oriented to position the three rows of keys substantially horizontally, the central row of keys assumes the highest position.

4,128,890

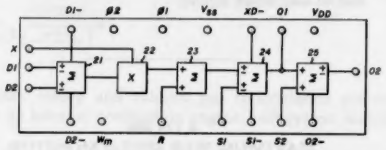
INTEGRATED ARITHMETIC UNIT AND DIGITAL NETWORKS USING THE UNIT

John M. Irwin, Clay, and Fritz H. Schlereth, Baldwinsville, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,194

Int. Cl.[2] **G06F** *15/34, 7/39*

U.S. Cl. 364—724 **21 Claims**



1. An integrated arithmetic unit for use in a serial digital network comprising:

A. a first summer for signed serial data having a pair of inputs (D1, D2) for external connection and producing an output sum in signed serial format;

$$(D1 + D2)$$

B. four quadrant multiplication logic for signed serial data having a first input coupled to the output of said summer, a second input (X) for external connection, said multiplication logic producing a double precision output product in signed serial format;

$$(D1 + D2)\,X$$

and

C. a second summer for signed serial data having a first input coupled to the output of said multiplication logic, a second input (S1) for external connection, and producing an external output sum (O1) in signed serial format:

$$O1 = [(D1 + D2)\,X + S1].$$

4,128,891

MAGNETIC BUBBLE DOMAIN RELATIONAL DATA BASE SYSTEM

Yeong S. Lin, Mt. Kisco; Chao N. Liu, Yorktown Heights, and Donald T. Tang, Mt. Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,892

Int. Cl.[2] **G06F** *7/00, 13/00;* **G11C** *11/14, 19/08*

U.S. Cl. 364—900 **14 Claims**

1. A magnetic bubble domain relational data base system using bubble domains to represent information, comprising:

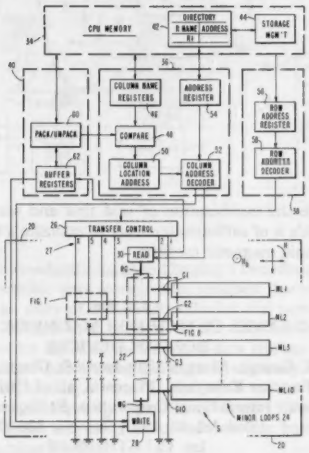
a magnetic medium in which said bubble domains can be stored,

a bubble domain storage device adjacent to said magnetic medium for storing tables of bubble domains representing

tables of related data items, said storage device having shift registers for storing columns and rows of bubble domains corresponding to columns and rows of data in said tables,

column access means adjacent to said magnetic medium for accessing selected columns of bubble domains from said storage device,

row access means adjacent to said magnetic medium for accessing selected rows of bubble domains from said



storage device including means for accessing an individual row of bubble domain data from said storage device,

control means connected to said column and row access means for determining the addresses of said columns and rows of data in said storage device, and

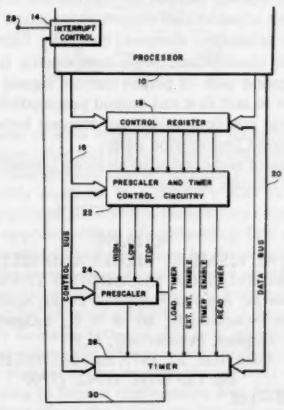
means connected to said column and row access means and to said control means for forming new tables of said data from said related data items stored in said bubble domain storage device.

4,128,892

PULSE WIDTH MEASUREMENT CIRCUITRY

Suresh L. Vasa, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Sep. 7, 1977, Ser. No. 831,306
Int. Cl.[2] G06F *7/38, 9/18;* **G04F** *10/00*
U.S. Cl. 364—900 **7 Claims**



1. External pulse width measuring circuitry for use in a microprocessor system including a microprocessor unit, a data bus for transferring data between said microprocessor and said measuring circuitry, a control bus for transmitting control signals and system clock signals to said measuring circuitry, an interrupt control circuit for receiving interrupt signals generated external of said microprocessor unit, and a counter circuit, said pulse width measuring circuitry comprising:

a control register coupled to the data bus and the control bus for receiving external pulse measurement instruction data from the microprocessor;

prescaler and timer control circuitry coupled to said control register and said control bus for generating from said instruction data, the control signals, and the system clock signals, a plurality of output signals for controlling the operation of the pulse width measuring circuitry;

a prescaler coupled to said control circuitry and said control bus for generating counting pulses from said system clock signals and at a frequency controlled by said control circuitry, the generation of said counting pulses being enabled or inhibited by said control circuitry output signals representing the leading edge and end-of-pulse transitions, respectively, of said external pulse; and

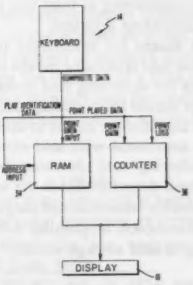
timing circuitry coupled to said prescaler, said control circuitry, said data bus, said control bus, and to the microprocessor interrupt control circuit for counting said counting pulses, storing said count, transferring said count to said data bus upon receipt of a particular first output signal from said control circuitry, and for producing and transmitting to said microprocessor interrupt control circuit an external interrupt request signal upon the occurrence of an end-of-pulse transition of said external pulse.

4,128,893

METHOD OF AND DEVICE FOR ANALYZING PERFORMANCES IN ATHLETIC EVENTS

Eugene C. Johnson, 5719 Newington Rd., Bethesda, Md. 20016, and Frederick F. Dalessio, Aston, Pa., assignors to Eugene C. Johnson, Bethesda, Md.

Filed Jan. 13, 1977, Ser. No. 759,251
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—900 **17 Claims**



1. An apparatus for logging categorizable data, comprising:

keyboard entry means for generating categorizable first signals, and second signals associated with said first signals;

addressable memory means containing a plurality of category storage locations;

means responsive to said second signals for addressing said category storage locations in said memory means;

means for storing said first signals in said memory means respectively in the category storage locations addressed by said second signals;

means for combining said first signals in said category storage locations with any first signals previously stored in said locations;

means controlled by said keyboard for recalling said com-

bined first signals stored in selected ones of said category storage locations;

means for visually displaying said recalled signals; and

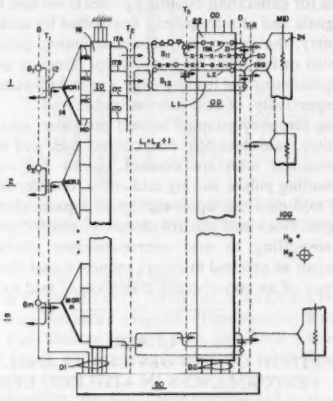
counter means responsive to said keyboard entry means for accumulating a total of said first signals keyboard entered into said plurality of category storage locations within said memory means.

4,128,894

BUBBLE DOMAIN CIRCUIT ORGANIZATION

Thomas T. Chen, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 14, 1977, Ser. No. 806,419
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—4 **16 Claims**



1. A device for operating on magnetic bubble domains comprising:

generator means for selectively producing bubble domains;

replicator means for splitting said domains from said generator means into a plurality of new domains;

storage means comprising at least one storage loop for storing and recirculating domains;

input decoder means for selectively transferring said new domains from said replicator means to said storage means;

detector means for detecting said domains;

output decoder means for decoding said domains to be transferred from said storage means to said detector means; and

switch means associated with said storage means for selectively transferring said domains between said storage means and said detector means via said decoding means;

said output decoder means comprising at least one propagation path connected in parallel with a portion of said storage loop in said storage means.

4,128,895

MAGNETIC WALL ASSISTED BUBBLE DOMAIN NUCLEATOR

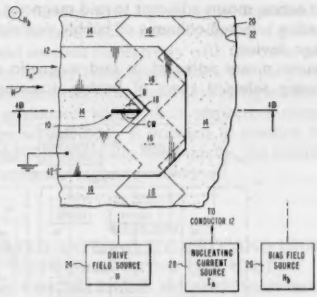
George S. Almasi, Katonah; George E. Keefe, Montrose, and Yeong S. Lin, Mt. Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1977, Ser. No. 801,963
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—11 **23 Claims**

1. A magnetic bubble domain nucleator for nucleating magnetic bubble domains in a magnetic medium, comprising:

means including a magnetic layer for producing a magnetic charged wall therein when a magnetic field is present in said magnetic layer, said charged wall having a first magnetic field associated therewith directed anti-parallel to the direction of magnetization of said magnetic medium,

magnetic means for producing a second magnetic field directed parallel to said first magnetic field,



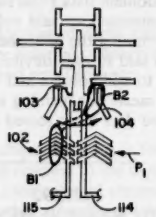
where the combination of said first and second magnetic fields is of sufficient intensity to nucleate a bubble domain in said magnetic medium.

4,128,896

ONE-LEVEL SWITCH FOR MAGNETIC BUBBLE DOMAIN DEVICES

Peter K. George, Morgan Hill; Isoris S. Gergis, Yorba Linda, and Tsutomu Kobayashi, Placentia, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 28, 1977, Ser. No. 820,073
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—12 **13 Claims**



1. A one-level switch for magnetic bubble domain devices comprising,

first and second propagation paths deposited adjacent to each other,

a half-disc transfer element included in said first propagation path and adjacent said second propagation path, and

a pair of conductor elements integrally formed with said transfer element and with components in said second propagation path to permit current signals to be applied relative to said first and second propagation paths so that magnetic bubble domains can interact between said first and second propagation paths,

at least one of said conductor elements connected to the base of said transfer element.

4,128,897

ARCHIVAL MEMORY MEDIA AND METHOD FOR INFORMATION RECORDING THEREON

James F. Norton, Alplaus; Harold G. Parks, Scotia, and George E. Possin, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

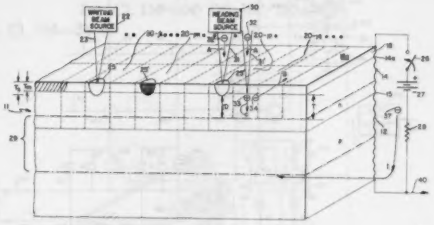
Filed Mar. 22, 1977, Ser. No. 780,175
Int. Cl.[2] G11C *11/42, 17/06*
U.S. Cl. 365—118 **14 Claims**

1. An archival memory target for essentially permanent storage of binary information, comprising:

a substrate of a semiconductor material containing doping impurities of a first polarity-type, said substrate having a first surface;

a layer of said semiconductor material containing doping impurities of an opposite polarity-type and fabricated upon said first surface of said substrate, said layer having a surface spaced from said first surface; and

an overlayer of a conductive non-doping material capable of forming a eutectic alloy with said semiconductor material, said overlayer being fabricated directly upon said surface



of said semiconductor layer and having a two-dimensional array of possible data storage sites assigned thereto;

a region of an alloy of said semiconductor and non-doping materials formed in a portion of the thickness of said semiconductor layer at each of said data storage sites at which a bit of information having a first binary value is non-erasably stored;

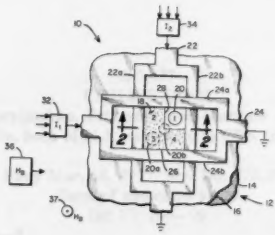
the remaining data storage sites being devoid of an alloy region to store thereat a bit of information having the remaining binary value.

4,128,898

STRUCTURING OF BUBBLE DOMAINS IN A BUBBLE DOMAIN MEMORY PLANE

Roger E. Lund, Woodbury, and Marlin M. Hanson, Cologne, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,318
Int. Cl.[2] G11C *11/14*
U.S. Cl. 365—2 **10 Claims**



1. In a bubble domain memory system including a planar layer of a magnetizable material in which bubble domains may be generated, sustained and moved between first, second, third and fourth stable positions in a memory area in said layer, which stable positions are within a memory area that is defined by the inside opposing edges of intersecting first and second inductively coupled slotted strip lines, by drive current signals that are coupled to said layer by said slotted strip lines, in the method of preventing said bubble domains from escaping from the magnetomotive effect of said drive current signals to transfer said bubble domains between said first, second, third and fourth stable positions, the improvement comprising:

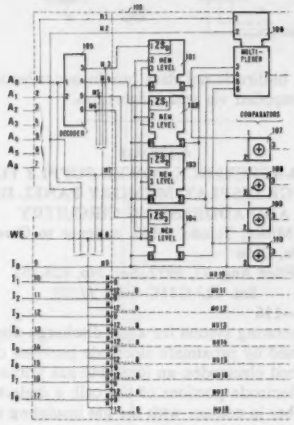
removing a portion of the surface of said layer within said memory area to form a confinement area having a thickness gradient along the periphery thereof, said thickness gradient generating a field H_P that is oriented normal to the plane of said layer for preventing bubble domains from escaping from said confinement area.

4,128,899

ASSOCIATED READ/WRITE MEMORY

Daniel Vinot, Sucy-en-Brie, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull, Paris, France

Filed Apr. 6, 1977, Ser. No. 785,234
Claims priority, application France, Apr. 15, 1976, 76 11233
Int. Cl.[2] G11C *15/00*
U.S. Cl. 365—49 **5 Claims**



1. An associative read/write memory comprising first storage means which can be read from or written into said first storage means includinng a plurality of memory units of equal capacity, each containing an equal and pretermined number of levels, addressing means connected to the said first storage means for selecting the required memory location on the selected level, and associative means connected to the said first storage means, said associative means consisting of comparators equal in number to the number of levels in each memory unit multiplied by the number of memory units for performing a comparison between the content of a data descriptor at the input to the associative memory and the content of the information read from the memory on the selected level.

4,128,900

PROGRAMMABLE READ ONLY MEMORY FOR ELECTRONIC ENGINE CONTROL

John P. Lappington, Huntsville, Ala., assignor to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 709,467, Jul. 28, 1976, Pat. No. 4,084,240.
This application Feb. 6, 1978, Ser. No. 875,344
Int. Cl.[2] G11C *17/00, 8/00*
U.S. Cl. 365—94 **1 Claim**

1. A programmable read only memory integrated circuit and associated circuitry for reading and writing data from and on the programmable read only memory integrated circuit comprising in combination:

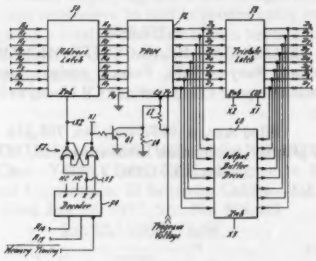
an address bus containing an address latch circuit;

means connecting the address bus to the address input of the programmable read only memory integrated circuit;

a bi-directional data bus containing a tri-state latch circuit and an output buffer drive circuit connected in parallel;

means connecting said bi-directional data bus to the data input/output of the programmable read only memory integrated circuit;

and control means for reading and writing data from and on the programmable read only memory integrated circuit



via said bi-direcitonal data bus in accordance with addresses supplied via said address bus.

4,128,901

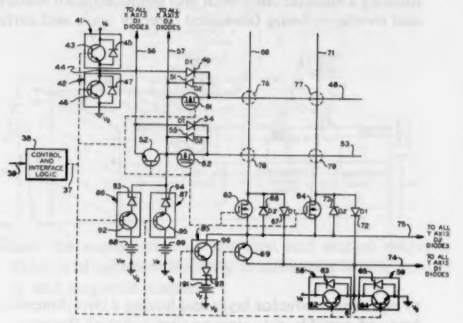
GROUND-REFERENCE POWER SUPPLY FOR GAS DISCHARGE DISPLAY/MEMORY PANEL DRIVING AND ADDRESSING CIRCUITRY

John W. V. Miller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 17, 1977, Ser. No. 825,291
Int. Cl.[2] G11C *7/00, 11/28*
U.S. Cl. 365—116 **8 Claims**

1. In an operating system for a gas discharge display/memory cell defined by proximate electrode portions of a pair of opposed spaced electrodes; an ionizable gas volume between the spaced electrode portions of the cell; a dielectric charge storage member in contact with the gas insulating at least one electrode portion of the cell from the gas; a sustainer voltage source for cyclically imposing a pulsating voltage having a period and a predetermined maximum potential referenced from a ground potential across the cell; and an addressing means for generating address voltage pulses to manipulate the discharge state of the cell between an "on state" and an "off state," the improvement comprising:

means for generating write and erase address voltage pulses



included in the addressing means, said write pulse referenced from the ground potential for changing the cell from the "off state" to the "on state" and said erase pulse referenced from the ground potential for changing the cell from the "on state" to the "off state"; and

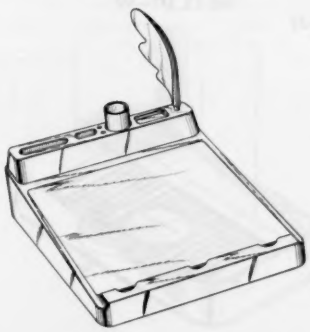
switching means connected between the addressing means and the pair of opposed spaced electrodes for applying said write and erase pulses to the cell.

DESIGNS

DECEMBER 5, 1978

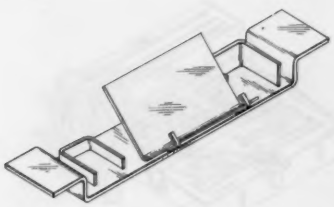
250,436
PAINT APPLICATOR
Elias J. Johnson, 503 Steven St., Green Bay, Wis. 54303
Filed Mar. 17, 1976, Ser. No. 661,121
Term of patent 14 years
Int. Cl. D4—*04;* D9—*01;* D7—*99*
U.S. Cl. D4—38

250,437
CHILD'S DESK
Erkki P. Korpijaakko, Princeton, and Matthew A. Moustakas, Mercerville, both of N.J., assignors to CBS Inc., New York, N.Y.
Filed Mar. 16, 1977, Ser. No. 778,297
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—5

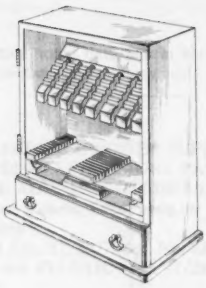


250,438
EYEGLASS DISPLAY RACK
Joseph Loiacono, Fort Salonga, N.Y., assignor to Eye-Vue Systems, Inc., New York, N.Y.
Filed Jul. 21, 1977, Ser. No. 817,720
Term of patent 14 years
Int. Cl. D20—*02;* D25—*01*
U.S. Cl. D6—28

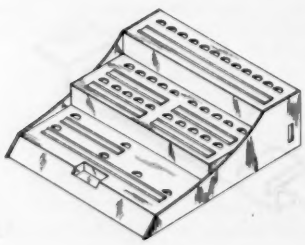
250,439
BATH TUB TRAY
Thomas Holstein, 3300 N. Lake Shore Dr., Chicago, Ill. 60657
Filed Aug. 18, 1976, Ser. No. 715,558
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—86



250,440
FLATWARE CABINET
S. Kirk Millspaugh, Baltimore, Md., assignor to The Kirk Corporation, Baltimore, Md.
Filed Nov. 26, 1976, Ser. No. 745,416
Term of patent 14 years
Int. Cl.[2] D6—*04*
U.S. Cl. D6—172

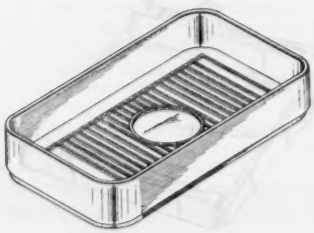


250,441
COUNTER DISPLAY UNIT FOR COSMETICS
Fred Richman, and Jerry Hammer, both of New York, N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Oct. 8, 1976, Ser. No. 731,031
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—188

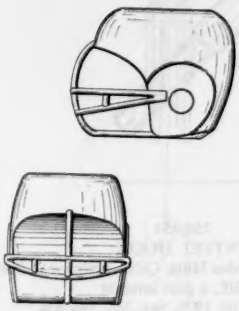


250,442
CHAIR FRAME OR SIMILAR ARTICLE
James B. Pesiri, Dana Point, Calif., assignor to J. C. Sales & Mfg. Inc., Irwindale, Calif.
Filed Feb. 11, 1977, Ser. No. 767,816
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—191

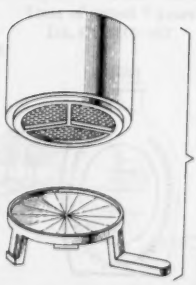
250,443
SERVING TRAY
David L. Romanoff, 29 E. 28th St., New York, N.Y. 10016
Filed Apr. 26, 1977, Ser. No. 791,161
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—37



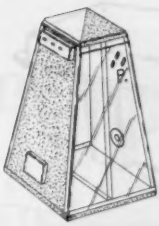
250,444
DRINKING MUG
Alfred W. Danat, Huntsville, Ala., and John L. Schaefer, Alexandria, Va., assignors to Sallet, Inc.
Filed Apr. 1, 1977, Ser. No. 783,841
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—5



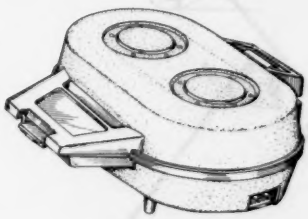
250,445
COMBINED COFFEE FILTER AND SUPPORT BASE
Werner Braun, Wilen, Sarnen, Switzerland, assignor to Maxs AG, Sachseln, Switzerland
Filed Jun. 16, 1976, Ser. No. 696,494
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, URA 940/75
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



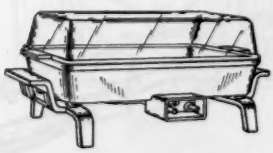
250,446
CONDIMENT DISPENSER
Rodney A. Johnson, 1800 Jamica Dr., Miramar, Fla. 33023, and Francis W. Selby, Box 170, R.D. #1, Middletown, Del. 19709
Filed Oct. 18, 1976, Ser. No. 733,461
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—57



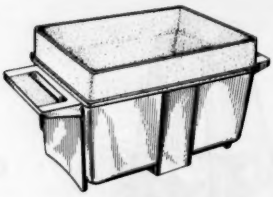
250,447
ELECTRIC DONUT MAKER
Monte L. Levin, New York, N.Y., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Sep. 19, 1977, Ser. No. 834,431
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—88



250,448
ELECTRIC COOKING UTENSIL
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and Robert S. Huff, Oak Park, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Oct. 28, 1976, Ser. No. 736,409
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94

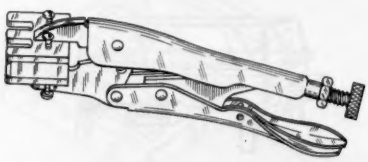


250,449
ELECTRIC DEEP FAT FRYER
Monte L. Levin, New York, N.Y., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Jan. 17, 1977, Ser. No. 759,715
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94



250,450
CORDLESS VEGETATION TRIMMER
Robert J. Tiedemann, Stamford, Conn., assignor to The Toro Company, Minneapolis, Minn.
Filed May 25, 1978, Ser. No. 909,717
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

250,451
VISE GRIP CLAMP FOR STRINGING RACQUETS
Donald A. Chartier, 88 Walnut St., Nashua, N.H. 03060, and Richard Janes, 4E Pine Isle Dr., Derry, N.H. 03038
Filed Jan. 5, 1977, Ser. No. 756,763
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—52



250,452
HONING TOOL
Frederick E. Heischman, Fostoria, Ohio, assignor to Fram Corporation, East Providence, R.I.
Filed Aug. 23, 1976, Ser. No. 716,908
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D8—91

250,453
SWIVEL HOOK
Howard J. Horwitz, Hidden Hills, Calif., assignor to Spencer G. Horwitz, Tarzana, Calif., a part interest
Filed Nov. 10, 1976, Ser. No. 740,304
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

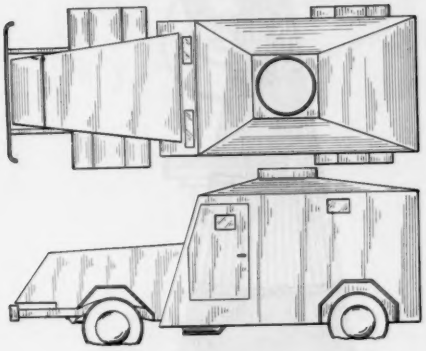
250,454
BOTTLE
Lucien O. Frohling, North Caldwell, N.J., assignor to General Foods Corporation, White Plains, N.Y.
Filed Sep. 22, 1976, Ser. No. 726,023
The portion of the term of this patent subsequent to Dec. 21, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—67

250,455
WIND CHIMES
James E. Mohrhauser, Racine, Wis., assignor to Foxmohr Crafts, Inc., Racine, Wis.
Filed Jan. 27, 1977, Ser. No. 762,844
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D10—116

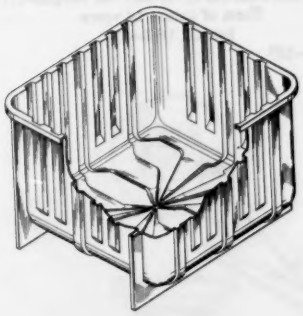
250,456
EARRING
Martin B. Fishman, 765 Massachusetts Ave., Cambridge, Mass. 02139
Filed May 5, 1977, Ser. No. 793,966
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—48

250,457
EARRING
Martin B. Fishman, 765 Massachusetts Ave., Cambridge, Mass. 02139
Filed May 5, 1977, Ser. No. 793,965
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—55

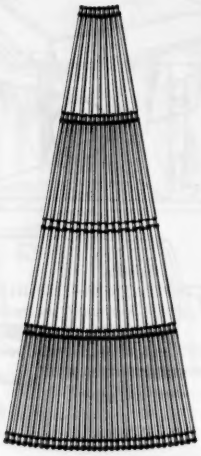
250,458
ARMORED CAR
Russell E. Bauer, 920 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed May 31, 1977, Ser. No. 802,282
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12



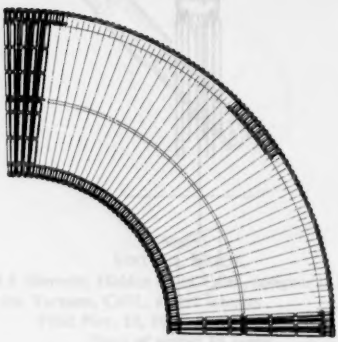
250,459
CONTAINERIZED PALLET
Chester Fields, E. 3143 - 35th Ave., Spokane, Wash. 99203
Filed Apr. 22, 1977, Ser. No. 789,987
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—53



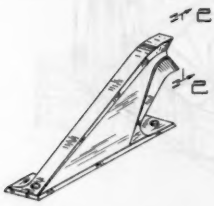
250,460
ROLLER CONVEYOR BELT FOR CURVED PATH
Ronald D. Bourgeois, 119 River St., Waltham, Mass. 02154
Filed Nov. 1, 1976, Ser. No. 737,551
Term of patent 14 years
Int. Cl.[2] D12—*05*
U.S. Cl. D12—60



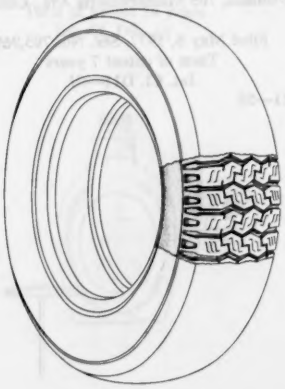
250,462
ROLLER CONVEYOR BELT FOR CURVED PATH
Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154
Filed Nov. 1, 1976, Ser. No. 737,665
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



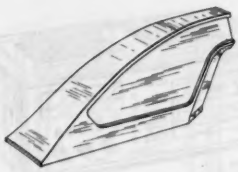
250,461
AUTOMOTIVE LUGGAGE RACK STANCHION
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Jun. 16, 1977, Ser. No. 807,028
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



250,463
TIRE
Philippe Jamain, Chatel-Guyon, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jul. 25, 1977, Ser. No. 818,974
Claims priority, application France, Jan. 24, 1977, 527
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—149



250,464
VEHICLE LUGGAGE RACK STANCHION
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Jun. 16, 1977, Ser. No. 807,029
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



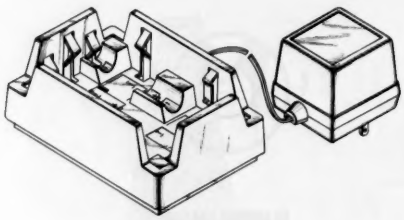
250,465
VEHICLE TRACTION BAR
Charles A. Morrison, 1500 Mono Way, Sonora, Calif. 95370
Filed Feb. 17, 1977, Ser. No. 769,577
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—159

250,466
TANK CAP
John D. O'Banion, Arlington, Tex., assignor to E-Z Fill Corporation
Filed Jun. 10, 1977, Ser. No. 805,497
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—197

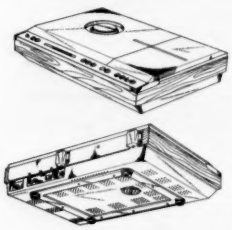
250,467
TANK CAP
John D. O'Banion, Arlington, Tex., assignor to E-Z Fill Corporation
Filed Jun. 10, 1977, Ser. No. 805,504
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—197

250,468
TANK CAP
John D. O'Banion, Arlington, Tex., assignor to E-Z Fill Corporation
Filed Jun. 9, 1977, Ser. No. 805,205
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—197

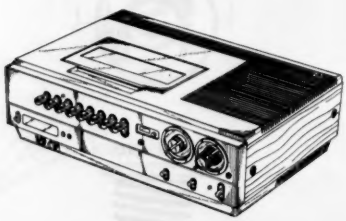
250,469
MULTI-CELL BATTERY CHARGER
William T. Kelly, III, Wilton, Conn., and Francis Stahl, Rocky River, Ohio, assignors to Union Carbide Corporation, New York, N.Y.
Filed Feb. 7, 1977, Ser. No. 766,385
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—5



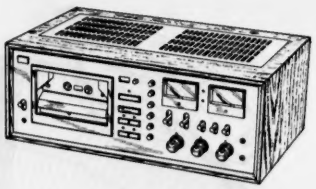
250,470
VIDEO DISC PLAYER
Koichi Nishigaki, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan
Filed Apr. 20, 1977, Ser. No. 789,321
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2



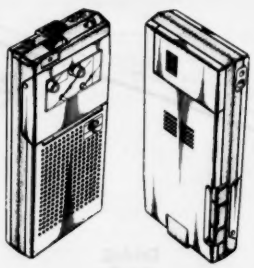
250,471
VIDEO TAPE RECORDER
Koichi Nishigaki, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan
Filed Apr. 20, 1977, Ser. No. 789,322
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2



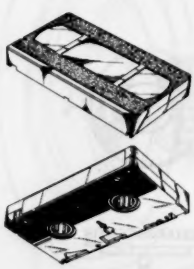
250,472
TAPE DECK
Tethuro Ikoma, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Apr. 5, 1977, Ser. No. 784,866
Claims priority, application Japan, Nov. 19, 1976, 51/45728
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



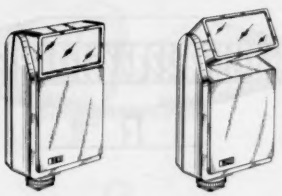
250,473
TAPE RECORDER
Toshihiko Kadota, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan
Filed Apr. 11, 1977, Ser. No. 786,334
Claims priority, application Japan, Oct. 15, 1976, 51/40843
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



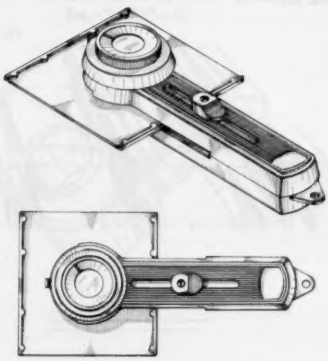
250,474
VIDEO TAPE CASSETTE
Koichi Nishigaki, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan
Filed Apr. 20, 1977, Ser. No. 789,373
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11



250,475
ADJUSTABLE HEAD ELECTRONIC FLASH UNIT
Masahiro Kando, Tokyo, Japan, assignor to Canon Kabushiki, Tokyo, Japan
Filed Mar. 2, 1977, Ser. No. 773,686
Claims priority, application Japan, Sep. 7, 1976, 51/35272
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



250,476
HAND-HELD VIEWER FOR NAVIGATIONAL CHARTS OR THE LIKE
DeForrest A. Olson, decesed, late of Seattle, Wash. (by Emilline M. Olson, administratrix), assignor to Charles J. Barkee, San Rafael, Calif.
Filed Oct. 6, 1975, Ser. No. 619,659
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—54

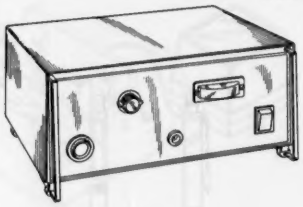


250,477
PAGE HOLDER FOR AN OPEN BOOK
Allan N. Hale, and Helen W. Hale, both of 7207 Hilton Ave., Takoma Park, Md. 20012
Filed Nov. 10, 1975, Ser. No. 630,333
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—34

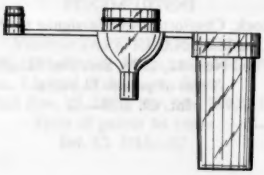
250,478
WRITING PEN
Rudi Jahraus, Keltern-Ellmendingen, Fed. Rep. of Germany, assignor to Moriz Hausch GmbH, Pforzheim, Fed. Rep. of Germany
Filed Feb. 9, 1977, Ser. No. 766,902
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 3755
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45

250,479
FOOT CONTROLLER FOR DENTAL HANDPIECE INSTRUMENTS
Giles R. Babcock, Charlotte, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed Nov. 12, 1976, Ser. No. 741,362
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—5

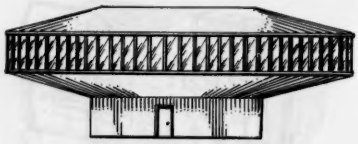
250,480
BIPOLAR ELECTRICAL SURGICAL GENERATOR
Ludwig A. Wettermann, Arlington Heights, Ill., and Peter H. Wettermann, Dayville, Conn., assignors to Richard Wolf Medical Instruments Corporation, Rosemont, Ill.
Filed Feb. 11, 1977, Ser. No. 767,896
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8



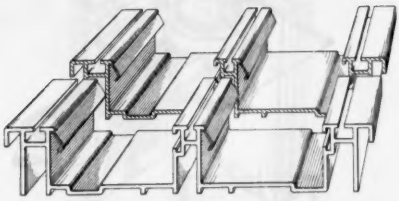
250,481
BLOOD COLLECTOR
Goerge F. Whattam, Timonium, Md., assignor to Hynson, Westcott & Dunning, Inc., Baltimore, Md.
Filed Nov. 8, 1976, Ser. No. 739,784
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21



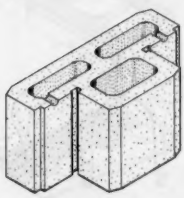
250,482
BUILDING
Robert H. Forstrom, Box 129, N. Hackensack Station, River Edge, N.J. 07661
Filed Oct. 5, 1976, Ser. No. 729,792
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—23



250,483
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, Levis, Canada, assignor to P. H. Tech Inc., Quebec, Canada
Filed Mar. 22, 1977, Ser. No. 780,076
Claims priority, application Canada, Sep. 22, 1976, 2209761
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

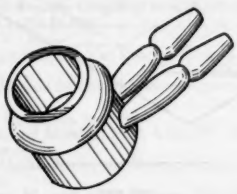


250,484
BUILDING BLOCK
George B. Muse, Hillcrest Dr., Calhoun, Ga. 30701
Filed Dec. 13, 1976, Ser. No. 749,782
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—87

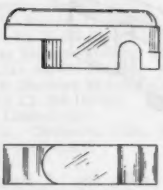


250,485
SMOKING DEVICE
Eugene R. Cuthbertson, 2016 Broadway, Santa Monica, Calif. 90404
Filed Aug. 15, 1977, Ser. No. 824,395
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

250,486
SMOKING PIPE
Boyce R. McCorkle, 5802 Kingston Pike, Knoxville, Tenn. 37919
Filed Aug. 22, 1977, Ser. No. 826,337
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

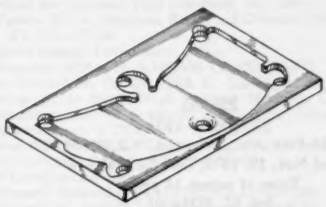


250,487
HINGE FOR POULTRY CAGE GATE
Donald L. DeMyer, c/o Cycle Systems, Inc., 9290 Belding Rd. NE., Rockford, Mich. 49341
Division of Ser. No. 694,567, Jun. 10, 1976, Pat. No. Des. 246,120. This application Jul. 18, 1977, Ser. No. 816,704
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2

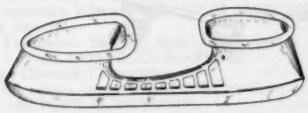


250,488
ANIMAL TETHER
Paul C. Wilmot, P.O. Box 982, Elkhart, Ind. 46514
Filed Jan. 13, 1977, Ser. No. 759,185
Term of patent 14 years
Int. Cl. D30—*09*
U.S. Cl. D30—44

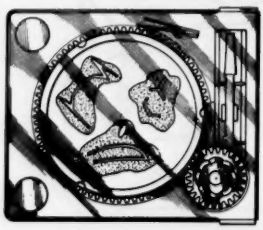
250,489
POOL TABLE TOP WITH NON-UNIFORM RAILS
Carl J. Feck, 116 S. 11th St., Richmond, Ind. 47374
Filed Aug. 2, 1976, Ser. No. 711,054
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—3



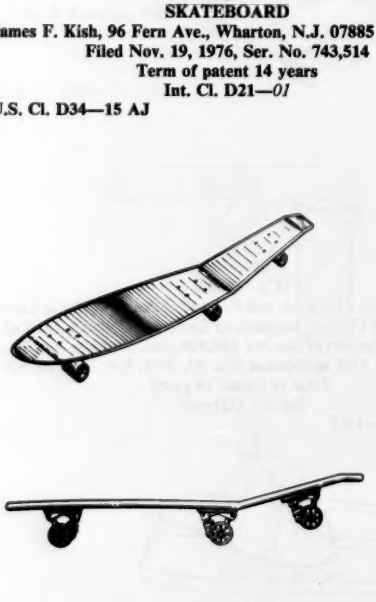
250,490
ICE SKATE
Hugh E. Baikie, Montreal, and Peter W. Schaack, Ville St-Laurent, both of Canada, assignors to Kenbudge Holdings Limited
Continuation-in-part of Ser. No. 649,926, Jan. 19, 1976, Pat. No. Des. 245,872. This application Sep. 27, 1976, Ser. No. 726,742
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—14 B



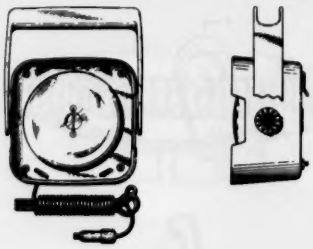
250,491
DRAWING TOY
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jun. 9, 1976, Ser. No. 694,132
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



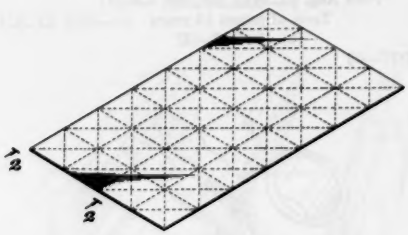
250,492
SKATEBOARD
James F. Kish, 96 Fern Ave., Wharton, N.J. 07885
Filed Nov. 19, 1976, Ser. No. 743,514
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



250,493
HAND-HELD SPOTLIGHT
John B. Brinkmann, 3525 Turtle Creek, Dallas, Tex. 75219
Filed Jun. 10, 1977, Ser. No. 805,621
Term of patent 14 years
Int. Cl. D26—*04, 02*
U.S. Cl. D48—20 K



250,494
DISPOSABLE BED COVERING
Melvin E. Householder, 10852 Sierra Hwy., Aqua Dulce, Calif. 91350
Filed Jul. 9, 1976, Ser. No. 703,951
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B



250,495
CASSETTE CASE
Carlos A. Mollura, 2824 Del Oro Pl., Fullerton, Calif. 92655
Filed Apr. 7, 1977, Ser. No. 785,318
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D

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TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF DECEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Adams, Stewart S.; Armitage, Bernard J.; Nicholson, John S.; and Tantum, James G., to Boots Pure Drug Company Limited. 2-(Substituted phenyl)propionic acids. 4,128,573, Cl. 562-465.000.

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Ahlgren, Nils H. Method for casting concrete structures. 4,128,610, Cl. 264-33.000.

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Lumsden, John R., 4,128,480, Cl. 210-332.000.

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van Linden, Jan H. L.; Claxton, Raymond J.; Herrick, Joseph R.; and Ormesher, Robert J., 4,128,415, Cl. 75-65.00R.

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Arnston, Robert W.; Trussell, Gerald C.; and Rich, Leo G., to Sun Electric Corporation. Automated engine component diagnostic techniques. 4,128,005, Cl. 73-117.300.

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Eimers, Erich; Dhein, Rolf; and Wiedermann, Rolf, 4,128,532, Cl. 528-79.000.
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Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, 4,128,533, Cl. 528-279.000.
Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, 4,128,534, Cl. 528-279.000.
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,128,412, Cl. 71-90.000.
Nothen, Karl; Creixell, Francisco B.; and Ehrig, Bodo, 4,127,945, Cl. 34-18.000.

BBC Brown, Boveri & Company Limited: *See*—
Lanz, Otto, 4,128,805, Cl. 324-52.000.

Bechtiger, Charles G., to Relhor S.A. Card input device for precision punching of cards. 4,128,237, Cl. 271-241.000.

Beck, Henry E.; Hasten, Jimmie L.; and Sindelar, Ernest C., to Caterpillar Tractor Co. High-reliability air brake system providing a plurality of operational modes. 4,128,276, Cl. 303-13.000.

Becker, Bernard, to Kraftwerk Union Aktiengesellschaft. Gas turbine installation with cooling by two separate cooling air flows. 4,127,988, Cl. 60-39.660.

Becker, Frank C.; Li, Jorge P.; and Williams, John W., to Abbott Laboratories. Industrial biocide. 4,128,529, Cl. 260-45.8NB.

Bell Telephone Laboratories, Incorporated: *See*—
Chang, Tao-Yuan; Damen, Theodoor C.; and Nguyen, Van-Tran, 4,128,772, Cl. 307-88.300.
Coldren, Larry A.; and Lemons, Ross A., 4,128,616, Cl. 310-328.000.
Davis, James A., 4,128,742, Cl. 179-18.0GF.
Hartman, Adrian R.; Melchior, Hans; Schinke, David P.; and Smith, Richard G., 4,127,932, Cl. 29-590.000.
Nutt, Wendell G.; and Roach, Mark E., 4,128,736, Cl. 174-112.000.

Beloit Corporation: *See*—
Justus, Edgar J., 4,128,455, Cl. 162-216.000.

Bendiberica, S. A.: *See*—
Rosell, Jorge E., 4,128,046, Cl. 91-375.00A.

Benditalia S.p.A.: *See*—
Manzini, Ferruccio, deceased; and Manzini, Laura C., administratrix, 4,128,249, Cl. 277-182.000.

Bendix Corporation, The: *See*—
Brown, Arthur K.; and Runkle, Dean E., 4,128,112, Cl. 137-544.000.
McComas, Arthur D., 4,128,839, Cl. 343-112.0CA.

Benjamin, Lawrence: *See*—
Barford, Brian D.; and Benjamin, Lawrence, 4,128,484, Cl. 252-8.800.

Bennett, Anthony E., to Tioxide Group Limited. Chlorine recovery process. 4,128,409, Cl. 62-26.000.

Bennett, Elmer W.: *See*—
Dhami, Kewal S.; Bennett, Elmer W.; and Burton, Pearl, 4,128,693, Cl. 428-379.000.

Berardinelli, Frank M.: *See*—
Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, 4,128,599, Cl. 260-857.00R.

Berger, Edwin: *See*—
Schlup, Gustave E.; and Berger, Edwin, 4,127,936, Cl. 29-721.000.

Berger, Klaus: *See*—
Illenberger, Arno; Ruprecht, Gert; and Berger, Klaus, 4,128,844, Cl. 357-31.000.

Berges, David A., to SmithKline Corporation. 7-Trifluoromethylthioacetamido-3-(3-sulfomethyl-1,2,4-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid. 4,128,722, Cl. 544-26.000.

Bergfried, Dietrich: *See*—
Gansert, Willi; Bergfried, Dietrich; Heinrich, Gert; Schnepf, Dietmar; Slansky, Harry; Pfluger, Eberhard; and Dorkel, Jean, 4,128,802, Cl. 322-28.000.

Bernhard, Horst: *See*—
Baumer, Wilhelm; Bernhard, Horst; Esselborn, Reiner; Ohngemach, Jorg; Stahlecker, Otto; and Zureda, Fritz, 4,128,435, Cl. 106-148.000.

Bernstein, Albert, to Communications Technology Corporation. Front tap shoe for mounting on test block for telephone conductor pairs. 4,128,739, Cl. 179-1.0PC.

Bernstein, Jack: *See*—
Hoehn, Hans; Bernstein, Jack; and Vogt, B. Richard, 4,128,717, Cl. 544-361.000.

Berokoff, Andrew J. Tennis racket. 4,128,240, Cl. 273-75.000.

Beronia, Mario, to BAT Brevets et Applications Techniques S.A. Apparatus for loading and compressing solid waste in a box-like structure. 4,128,181, Cl. 214-83.300.

Berthold, Rudiger, to Hoechst Aktiengesellschaft. Process for the manufacture of α,β-unsaturated cycloaliphatic ketoximes. 4,128,579, Cl. 260-566.00A.

Bessendorf, Mikhael: *See*—
Lerner, Moisey; Morse, James H.; and Bessendorf, Mikhael, 4,128,461, Cl. 204-58.000.

Betts Machine Company: *See*—
Johnson, Kenneth L., 4,128,865, Cl. 362-369.000.

Betts, William L., to NCR Corporation. Combined encoder/decoder. 4,128,832, Cl. 340-347.0DD.

Beynand, Rudy: *See*—
Parker, Bill B.; Beynand, Rudy; and Cormier, Arthur J., 4,128,108, Cl. 137-327.000.

Bicking, John B.: *See*—
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,128,564, Cl. 260-401.000.

Bier, Adolf: *See*—
Leibrock, Kurt; Bier, Adolf; and Buch, Friedrich, 4,128,402, Cl. 44-11.000.

Bigelow, John E., to General Electric Company. DC Pop with varistor connected between control circuit and cathode. 4,128,787, Cl. 315-169.0TV.

Bilinsky, Michael C.; and Gold, Robert L. Compression device for tennis elbow. 4,128,097, Cl. 128-165.000.

Bintner, Dennis W., to Delavan Corporation. Low drift flat spray nozzle and method. 4,128,206, Cl. 239-11.000.

Bio-Dynamics Inc.: *See*—
Yamazaki, Yasuhiro; Johnson, Robert H.; and McNeil, Mark D., 4,128,339, Cl. 356-434.000.

Birch Brothers Southern, Inc.: *See*—
Birch, Steven W., 4,128,212, Cl. 242-56.00R.

Birch, Steven W., to Birch Brothers Southern, Inc. Seam responsive shear and method. 4,128,212, Cl. 242-56.00R.

Bison-werke Bahre & Greten GmbH & Co. KG: *See*—
Greten, Ernst, 4,128,373, Cl. 425-371.000.

Bitterice, Michael G.; and Keslar, Leroy D., to PPG Industries, Inc. Method of preparing lightweight window anti-static circuit and optional heating circuit. 4,128,448, Cl. 156-166.000.

Bittler, Rolf: *See*—
Horn, Peter; Koehler, Waldemar; and Bittler, Rolf, 4,128,569, Cl. 260-453.0PH.

BJ-Hughes Inc.: *See*—
Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., 4,128,888, Cl. 364-565.000.

Black, Walter L., to United States of America, Army. Color-disseminating projectile for training cartridge. 4,128,059, Cl. 102-92.700.

Blasetti, David H. Centrifugal mixer. 4,128,344, Cl. 366-348.000.

Block Drug Company, Inc.: *See*—
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,128,662, Cl. 424-319.000.

Blomqvist, Inge. S., to Sunnex Equipment AB. Servo-controlled valve. 4,128,227, Cl. 251-42.000.

Bloom, William G.; Choksi, Pradip V.; and Seemayer, Walter, to American Hospital Supply Corporation. Valved spike transfer device. 4,128,098, Cl. 128-272.300.

Blumbergs, John H.: *See*—
Finley, Joseph H.; and Blumbergs, John H., 4,128,490, Cl. 252-95.000.

Blumhardt, Harold, to Blumhardt Mfg., Inc. Surface irrigation gate. 4,128,107, Cl. 137-318.000.

Blumhardt Mfg., Inc.: *See*—
Blumhardt, Harold, 4,128,107, Cl. 137-318.000.

Boardman, James; and Ash, Peter M., to Triplex Safety Glass Company Limited. Toughened glass sheets. 4,128,690, Cl. 428-332.000.

BOC Limited: *See*—
Sharp, Charles M., 4,128,753, Cl. 219-121.00L.

Bock, Rudolf. Gas cushioned free piston type engine. 4,128,083, Cl. 123-46.00R.

Boehm, Leah: *See*—
Reisfeld, Renata; Eckstein, Yona; and Boehm, Leah, 4,128,411, Cl. 65-18.000.

Boeing Company, The: *See*—
Hansen, Karl A.; and Hendrickson, I. Glen, 4,127,933, Cl. 29-605.000.
Hogenhout, Franciscus; and McDermott, Arthur W., 4,128,000, Cl. 72-430.000.

Bogosh, Donald. Permanent pier piling. 4,127,992, Cl. 405-61.000.

Boise Cascade Corporation: *See*—
Hoelzinger, Walther J., 4,128,677, Cl. 428-57.000.

Bomio, Pietro; and Meier, Werner, to Sulzer Brothers Limited. Method of producing a packing and a packing layer made thereby. 4,128,684, Cl. 428-175.000.

Bond, Thomas J.; Kelly, William J.; and Adams, Richard C., to Standard Oil Company, The. Apparatus for controlling plastic material distribution in manufacture of biaxially oriented plastic containers. 4,128,383, Cl. 425-529.000.

Bondgrade Limited: *See*—
Ede, Douglas F. C., 4,128,118, Cl. 144-134.00D.

Bondinell, William E.; and Pendleton, Robert G., to SmithKline Corporation. 4 and 5-Halo substituted 2-indanamine compounds. 4,128,666, Cl. 424-330.000.

Bonis, Laszlo J., to Composite Container Corporation. System for preventing mandrel deflection in molding of thermoplastic materials. 4,128,381, Cl. 425-468.000.

Bons, Robert; and Kitaguchi, Sam S., to Garrett Corporation, The. Eductor muffler. 4,128,769, Cl. 290-52.000.

Booth, Eric, to National Research Development Corporation. Peripatetic vehicles. 4,128,137, Cl. 180-6.500.

Boots Pure Drug Company Limited: *See*—
Adams, Stewart S.; Armitage, Bernard J.; Nicholson, John S.; and Tantum, James G., 4,128,573, Cl. 562-465.000.

Boquist, Carl W.; and Marchant, David D., to United States of America, Energy. Magnetohydrodynamic electrode. 4,128,776, Cl. 310-11.000.

Borjesson, Leif R.; and Johansson, Lars-Ake, to Alfa-Laval AB. Spiral heat exchanger. 4,128,125, Cl. 165-163.000.

Borman, Willem F. H., to General Electric Company. Copolyesters of poly(alkylene glycol aromatic acid esters) and diesters comprising aromatic diols. 4,128,526, Cl. 260-40.00R.

Boroschewski, Gerhard: *See*—
Arndt, Friedrich; and Boroschewski, Gerhard, 4,128,413, Cl. 71-100.000.

Bortuzzo, Jean-Pierre: *See*—
Roullet, Gerald; and Bortuzzo, Jean-Pierre, 4,128,847, Cl. 358-128.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Loch, Friedhelm H.; Mailander, Hans; Riemath, Heinz; Schmid, Richard; and Stickel, Ernst, 4,128,287, Cl. 312-253.000.

Bost, John R., to Byars Machine Company. Counterbalance bearing assembly. 4,128,282, Cl. 308-20.000.

Bourne, Arnold H., to Westinghouse Canada Limited. Variable lead optical tracing machine with scanning and vari-focal lens. 4,128,297, Cl. 350-6.100.

Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, to Sandoz Ltd. Precursors of 4-(1-alkyl-4-piperidylidene-4H-benzo[4,5-]cyclohepta-[1,2-b]thiophen-10(9H)-ones. 4,128,549, Cl. 546-202.000.

Bourquin, Thomas E., deceased; and by Sanders, Maggie B., executrix. Fishhook extractor. 4,127,957, Cl. 43-53.500.

Bowen, Duane C. Bathing facility. 4,127,905, Cl. 4-148.000.

Boyle, Danny P. Multi-segmental cushion assembly for adapting contour dental chairs to a child's physique. 4,128,272, Cl. 297-231.000.

Bozeman, Arlene, executrix: *See*—
Harrison, Charles W.; and Bozeman, Paul P., Jr., deceased, 4,128,472, Cl. 208-33.000.

Bozeman, Paul P., Jr., deceased: *See*—
Harrison, Charles W.; and Bozeman, Paul P., Jr., deceased, 4,128,472, Cl. 208-33.000.

Bradbury, William B.; Watts, Robert H.; and Scott, E. Timm, to PMS Consolidated. Colorant comminuting apparatus for plastic article forming machine. 4,128,211, Cl. 241-101.600.

Bradshaw, John: *See*—
Price, Barry J.; Clitherow, John W.; and Bradshaw, John, 4,128,658, Cl. 424-285.000.

Brady, John F., to Universal Technology, Inc. Fluid impulse matrix printer. 4,128,345, Cl. 400-120.000.

Braga, Albert T.: *See*—
Brenner, Robert A.; Cuthbert, Victor W.; and Braga, Albert T., 4,128,210, Cl. 241-46.00R.

Bramati, Carlo, to Carle & Montanari S.p.A. Unmoulding machine for confectionary products. 4,128,377, Cl. 425-439.000.

Brandenstein, Manfred: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; and Schulz, Toni, 4,128,279, Cl. 308-6.00C.

Brands, Antoon H.; and Gietema, Jouke, to Hollandse Signaalapparaten B.V. Digital scan converter. 4,128,838, Cl. 343-55.00C.

Braun, Dieter; and Cramer, Hugo, to Felten & Guilleaume Kabelwerke GmbH. Method of and an apparatus for manufacturing a SZ twisted strand of elongated elements for telecommunication cables. 4,127,982, Cl. 57-294.000.

Braun, Rudolf; and Kellmann, Werner, to Sulzer Brothers Limited. Entraining element for a gripper shuttle. 4,128,115, Cl. 139-439.000.

Braunstein, Lee G. Gas regulator and gas-fired torch assemblies. 4,128,391, Cl. 431-354.000.

Braye, Emile, to Parcor. Process for the preparation of 2-(2-thienyl)-ethylamine and derivatives thereof. 4,128,561, Cl. 260-329.0AM.

Brecht, Heinz, to Siemens Aktiengesellschaft. Electrical high-voltage apparatus. 4,128,826, Cl. 338-204.000.

Breda Termomeccanica S.p.A.: *See*—
Straffi, Franco, 4,128,221, Cl. 248-68.00R.

Brenner, Robert A.; Cuthbert, Victor W.; and Braga, Albert T., to Whirlpool Corporation. Food waste disposal apparatus. 4,128,210, Cl. 241-46.00R.

Breslow, Jeffrey D.: *See*—
Hicks, Alan A.; Spinello, John O.; and Breslow, Jeffrey D., 4,128,246, Cl. 273-243.000.

Bretts, Gerald R.; and Timan, Dirk A., to Allied Chemical Corporation. Continuous electroplating of alloy onto metallic strip. 4,128,459, Cl. 204-28.000.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Cyanoalkylureido cephalosporins. 4,128,723, Cl. 544-25.000.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Hydrazinocarbonylamino cephalosporins. 4,128,724, Cl. 544-30.000.

Bristoline Inc.: *See*—
Enatsu, Shachio, 4,128,014, Cl. 73-729.000.

Britton, James E.; Metcalf, Fredric D.; Sommer, John G.; Kuan, Tiong H.; Rilling, Victor R.; and Welch, John A., to General Tire & Rubber Co., The. Polyethylene-EDPM compositions. 4,128,523, Cl. 260-33.6AQ.

Brodsky, Lee; Lorenz, Donald H.; Nelsen, Suzanne B.; and Tu, Shu T., to GAF Corporation. Cyano-oligomer compositions and processes thereof. 4,128,536, Cl. 427-54.000.

Brooker, Gary L.; Terasaki, Wesley L.; and Price, Michael G., to University of Virginia Alumni Patents Foundation. Automated immunoassay. 4,128,628, Cl. 424-1.000.

Brown, Arthur K.; and Runkle, Dean E., to Bendix Corporation, The. Spool valve for hydraulic brake booster. 4,128,112, Cl. 137-544.000.

Brown, Arthur M.: *See*—
Lee, Kai S.; Akaike, Norio; and Brown, Arthur M., 4,128,456, Cl. 195-127.000.

Brown, Boveri & Cie AG: *See*—
Rohr, Franz-Josef; and Krapf, Rudolf, 4,128,469, Cl. 204-195.00S.

Brown, Michael K.; Christou, Kyriakos; Lundquist, David E.; Maidment, Earl P.; and Shell, Ronald G., to Burroughs Corporation. Droplet microphone. 4,128,841, Cl. 346-75.000.

Brown & Root, Inc.: *See*—
Tillinghast, William S.; and Rochelle, William R., 4,127,950, Cl. 37-62.000.

Brown & Sharpe Manufacturing Company: *See*—
Headen, William E.; and Levesque, George N., 4,128,278, Cl. 308-3.00A.

Brownlee, Merrel F. Step ladder bracket. 4,128,223, Cl. 248-211.000.

Brunet, Maurice: *See*—
Habermann, Helmut; Brunet, Maurice; and Joly, Pierre, 4,128,795, Cl. 318-618.000.

Brunkhorst, Wilhelm: *See*—
Schmeidl, Karl; Brunkhorst, Wilhelm; and Michaelis, Eberhard, 4,128,623, Cl. 423-388.000.

Brunner, Ernst: *See*—
Knobloch, Johannes F.; and Brunner, Ernst, 4,128,870, Cl. 363-141.000.

Brussee, Warren T.; and Ferris, William G., to General Electric Company. Sealed beam lamp unit. 4,128,864, Cl. 362-306.000.

Buch, Friedrich: *See*—
Leibrock, Kurt; Bier, Adolf; and Buch, Friedrich, 4,128,402, Cl. 44-11.000.

Bucher, David H.; and Meinert, Harry M., to Deere & Company. Multiple section implement with beam raised and lowered on mast thereof. 4,128,131, Cl. 172-311.000.

Buchholz, Adolf. Method for steam drying. 4,127,946, Cl. 34-28.000.

Buchner, Werner; Degen, Bruno; Fries, Ludwig; Helmut, Judat; Mundil, Rudolf; and Rudolph, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the continuous preparation of polydiorganosiloxanes. 4,128,568, Cl. 260-448.20E.

Buckeye International, Inc.: *See*—
Roberts, Leslie N., 4,128,062, Cl. 105-420.000.

Buckeye Molding Company: *See*—
Allen, David O., 4,128,385, Cl. 425-549.000.
Allen, David O., 4,128,613, Cl. 264-161.000.

Buddecke, William A. Combined catfish killer and holder. 4,127,919, Cl. 17-70.000.

Bukamier, Gary L. Electrode structures. 4,128,468, Cl. 204-195.00F.

Bukowski, Raymond J.; and Erst, Frederick S., to Motiograph, Inc. Electronic order pricing system. 4,128,758, Cl. 235-433.000.

Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-PGF$_1$-morpholinylamides. 4,128,712, Cl. 542-426.000.

Bunker Ramo Corporation: *See*—
Grabow, Ronald D., 4,128,006, Cl. 73-724.000.
Occhipinti, Carl, 4,128,289, Cl. 339-75.0MP.

Bunkowski, Kenneth D.: *See*—
Goebel, James C.; Delapp, Darwin F.; and Bunkowski, Kenneth D., 4,128,696, Cl. 428-424.000.

Bunnell, Edward D., to AMP Incorporated. Eccentric bore connecting device. 4,128,295, Cl. 339-274.000.

Burdge, Lanny G.: *See*—
Layman, Bobby C.; and Burdge, Lanny G., 4,128,071, Cl. 114-221.00A.

Burleson, Robert R., to United States of America, Energy. Interferometric correction system for a numerically controlled machine. 4,128,794, Cl. 318-603.000.

Burness, Arnold M.; Ling, Hans G.; and Doppen, Glen M., to Eastman Kodak Company. Crosslinking polymeric dye mordant composition reaction product of bisalkane or bisarene sulfonate and vinyl polymer. 4,128,538, Cl. 260-884.000.

Burns, William K.; and Milton, A. Fenner, to United States of America, Navy. Optical waveguide power divider. 4,128,301, Cl. 350-96.150.

Buros, Melvin S., to Micr-Shield Company. Document carrier. 4,128,202, Cl. 235-493.000.

Burroughs Corporation: *See*—
Brown, Michael K.; Christou, Kyriakos; Lundquist, David E.; Maidment, Earl P.; and Shell, Ronald G., 4,128,841, Cl. 346-75.000.
Lamiaux, Sylves L., 4,128,873, Cl. 364-200.000.
Zachry, Clyde; White, Paul K.; and Layton, Wilbur T., 4,128,288, Cl. 339-45.00M.

Burton, Pearl: *See*—
Dhami, Kewal S.; Bennett, Elmer W.; and Burton, Pearl, 4,128,693, Cl. 428-379.000.

Bustos, Rafael T., to Leggett & Platt, Incorporated. Display rack with improved shelf assembly. 4,128,177, Cl. 211-49.00D.

Butler, Donald E., to Warner-Lambert Company. 3-Phenoxypyridine monosulfate and a method for its production. 4,128,555, Cl. 546-290.000.

Butler, Louis R. P., to South African Inventions Development Corporation, The. Spectroscopic apparatus and method. 4,128,336, Cl. 356-307.000.

Byars Machine Company: *See*—
Bost, John R., 4,128,282, Cl. 308-20.000.

C. J. Hendry Company: *See*—
Pizzo, Frank, 4,127,909, Cl. 9-11.00A.

Caero, Jose G., to Textron Inc. Actuator with locking valves. 4,128,047, Cl. 91-420.000.

Cagliero, Germano, to Marxer S.p.A. Method of and feed for farming egg-laying hens using nifuroxazide. 4,128,657, Cl. 424-285.000.

Cain, Shirley A., heir: *See*—
Terry, James A., deceased; Russell, Barbara P., heir; Terry, James F., heir; and Cain, Shirley A., heir, 4,128,117, Cl. 144-3.00K.

Calspan Corporation: *See*—
Fischer, Frederic P., II, 4,128,850, Cl. 358-284.000.

Cameron, Ian F.; and Layhe, Michael, to Automatic Oil Tools Limited. Meter proving apparatus. 4,128,002, Cl. 73-3.000.
Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., to Monsanto Company. Thermal conversion of 4-cyano-suberonitrile to acrylonitrile. 4,128,571, Cl. 260-465.900.
Campbell, John R.: *See—*
Klopfer, Howard J.; and Campbell, John R., 4,128,731, Cl. 568-726.000.
Campbell Soup Company: *See—*
Hildebolt, William M., 4,128,051, Cl. 99-348.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Gravel, Joseph A. M., 4,128,752, Cl. 219-121.00L.
Canadian General Electric Company Limited: *See—*
Herzog, Gordon W.; and Gaensbauer, Herbert A., 4,128,792, Cl. 318-706.000.
Cantarutti, Armindo, to NRM Corporation. Tire component building drum. 4,128,450, Cl. 156-417.000.
Capewell, James T.: *See—*
Niblett, David C.; and Capewell, James T., 4,128,267, Cl. 294-81.00R.
Caputo, William R.; and Husson, Alan L., to Westinghouse Electric Corp. Elevator system. 4,128,141, Cl. 187-29.00R.
Carl Freudenberg, Firma: *See—*
Pohland, Alois, 4,128,679, Cl. 428-131.000.
Carle & Montanari S.p.A.: *See—*
Bramati, Carlo, 4,128,377, Cl. 425-439.000.
Carlisle, Richard S. Frictional coupling device. 4,128,356, Cl. 403-292.000.
Caron, Jacques; Poncet, Jean-Claude; and Varney, Bernard, to Societe Anonyme dite: CECA S.A. Method and apparatus for determining permeability of filter media. 4,128,004, Cl. 73-38.000.
Carpenter Technology Corporation: *See—*
Karpen, William L., 4,128,487, Cl. 252-28.000.
Carr, William C.; Polinski, Leon M.; Hindin, Saul G.; and Kosco, James L., to Engelhard Minerals & Chemicals Corporation. Alkyl aromatic isomerization. 4,128,591, Cl. 260-668.00A.
Carstensen, Kenneth J.: *See—*
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., 4,127,927, Cl. 29-407.000.
Casaleggi, Charles J.: *See—*
Gaither, Howard H.; and Casaleggi, Charles J., 4,128,251, Cl. 277-233.000.
Cassar, Luigi; and Foa, Marco, to Montedison S.p.A. Process for preparing phenylacetic acid. 4,128,572, Cl. 562-406.000.
Castonguay, Roger N.; Jencks, Charles L.; and Turton, Robert C., to General Electric Company. Circuit breaker closure control and condition indicator apparatus. 4,128,750, Cl. 200-308.000.
Catano, Paul S.: *See—*
Stotts, Larry B.; Martin, William E.; and Catano, Paul S., 4,128,300, Cl. 350-96.140.
Caterpillar Tractor Co.: *See—*
Beck, Henry E.; Hasten, Jimmie L.; and Sindelar, Ernest C., 4,128,276, Cl. 303-13.000.
Chamberlain, Richard W., 4,127,952, Cl. 37-141.00R.
Coleman, Donald F.; and Rhodes, Sammy J., 4,128,827, Cl. 340-52.00R.
Meisel, Thomas C., Jr., 4,128,277, Cl. 305-54.000.
Moen, Lowell J.; and Olson, Harris S., 4,128,132, Cl. 172-747.000.
Ritter, Arthur J., 4,128,022, Cl. 74-694.000.
Cecchini, Giuliano. Stereoscopic films and viewers therefor. 4,128,320, Cl. 353-120.000.
Cecil, James B.: *See—*
Frederiksen, Thomas M.; and Cecil, James B., 4,128,775, Cl. 307-264.000.
Celanese Corporation: *See—*
Gilbert, William C., 4,128,614, Cl. 264-205.000.
Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, 4,128,599, Cl. 260-857.00R.
Cervenka, Peter O.: *See—*
United States of America, National Aeronautics and Space Administration; Reinhardt, Victor S.; and Cervenka, Peter O., 4,128,814, Cl. 331-94.000.
Challenge-Cook Bros., Inc.: *See—*
Freze, Benjamin H., 4,128,388, Cl. 431-116.000.
Chamberlain, Richard W., to Caterpillar Tractor Co. Replaceable adapter for an earthworking tool. 4,127,952, Cl. 37-141.00R.
Champion International Corporation: *See—*
Roccaforte, Harry I., 4,128,168, Cl. 206-45.140.
Champion Laboratories, Inc.: *See—*
Gaither, Howard H.; and Casaleggi, Charles J., 4,128,251, Cl. 277-233.000.
Champion Spark Plug Company: *See—*
Manning, William R., 4,128,433, Cl. 106-55.000.
Chan, Jimmy H.: *See—*
Matsumoto, Kent E.; Chan, Jimmy H.; and Baker, Don R., 4,128,580, Cl. 260-566.00A.
Chang, Tao-Yuan; Damen, Theodoor C.; and Nguyen, Van-Tran, to Bell Telephone Laboratories, Incorporated. Generation of tunable far-infrared radiation. 4,128,772, Cl. 307-88.300.
Chapel, James F., to Chapel, James Frederick; Harper, Homer C., III; and Coyne, Michael F. Sterile oxygen system and replaceable filter therefore. 4,128,407, Cl. 55-259.000.
Chapel, James Frederick: *See—*
Chapel, James F., 4,128,407, Cl. 55-259.000.
Charnley, Ralph L.: *See—*
Melander, Theodore A.; and Charnley, Ralph L., 4,128,325, Cl. 354-298.000.
Chemische Werke Huels Aktiengesellschaft: *See—*
Reich, Manfred, 4,128,730, Cl. 568-914.000.
Westernacher, Helmut, 4,128,594, Cl. 260-674.00A.
Chen, Thomas T., to Rockwell International Corporation. Bubble domain circuit organization. 4,128,894, Cl. 365-4.000.
Chenot, Louis A., to Mid-Equipment, Inc. Trash compactor. 4,128,054, Cl. 100-233.000.
Chervenak, Michael C.; and Wolk, Ronald H., to Hydrocarbon Research, Inc. Pressure let-down valve assembly for handling abrasive liquids. 4,128,109, Cl. 137-375.000.
Chevron Research Company: *See—*
Honnen, Lewis R., 4,128,403, Cl. 44-71.000.
Chiang, Alice M., to Honeywell Inc. GaP Directed field UV photodiode. 4,128,843, Cl. 357-30.000.
Chicago Bridge & Iron Company: *See—*
Shadid, Fahim E.; and Johnson, Paul R., 4,128,070, Cl. 114-74.00A.
Chikamatsu, Shigeru: *See—*
Otsu, Shinpei; Sekiguchi, Akira; Tobita, Nobuyoshi; Chikamatsu, Shigeru; Hosoe, Yoshihisa; Matsui, Motoaki; Sugimoto, Noboru; and Totsuka, Noriyoshi, 4,128,378, Cl. 425-445.000.
Chimura, Kozo: *See—*
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, 4,127,984, Cl. 58-7.000.
Choksi, Pradip V.: *See—*
Bloom, William G.; Choksi, Pradip V.; and Seemayer, Walter, 4,128,098, Cl. 128-272.300.
Chomerics, Inc.: *See—*
Seeger, Richard E., 4,128,744, Cl. 200-5.00A.
Christie, Peter A.: *See—*
Barnett, David L.; Christie, Peter A.; and Eckert, Lewis W., 4,128,524, Cl. 260-39.00R.
Christofas, Alkis: *See—*
Bartoszek, Edward J.; and Christofas, Alkis, 4,128,519, Cl. 260-29.6NR.
Christou, Kyriakos: *See—*
Brown, Michael K.; Christou, Kyriakos; Lundquist, David E.; Maidment, Earl P.; and Shell, Ronald G., 4,128,841, Cl. 346-75.000.
Chrysler Corporation: *See—*
Balan, Isadore; and Kopera, Joseph J., 4,128,091, Cl. 123-148.00E.
Lappington, John P., 4,128,900, Cl. 365-94.000.
Chun, Ho-Ming: *See—*
Lundmark, Larry D.; Melby, Allan; and Chun, Ho-Ming, 4,128,631, Cl. 424-70.000.
Chung, Ming-Sum: *See—*
Chung, Ming-To; and Chung, Ming-Sum, 4,128,064, Cl. 108-111.000.
Chung, Ming-To; and Chung, Ming-Sum. Free standing shelves. 4,128,064, Cl. 108-111.000.
Ciba-Geigy Corporation: *See—*
Nachbur, Hermann; Hiestand, Armin; and Rohringer, Peter, 4,128,687, Cl. 428-253.000.
Rossler, Erich; Deiner, Hans; Sandner, Bernhard; and Schilling, Hans, 4,128,675, Cl. 427-390.00E.
Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, 4,128,718, Cl. 548-313.000.
Wick, Arnold; and Jost, Max, 4,128,396, Cl. 8-39.00C.
Cicatelli, Rodolfo, to Autovox, S.p.A. Device for the storage of power and its controllable, slow rate release. 4,128,015, Cl. 74-89.170.
Clarke, Ernest J., to NCR Corporation. Cover plate for a microform reader. 4,128,319, Cl. 353-27.00R.
Clarke, George C. Variable speed drive. 4,128,017, Cl. 74-230.17D.
Classic Chemical: *See—*
Coryell, Stanley W., 4,128,192, Cl. 222-525.000.
Claudio, Gillio, to Ing. C. Olivetti & C., S.p.A. Keyboard recocking mechanism. 4,128,382, Cl. 400-478.000.
Claxton, Raymond J.: *See—*
van Linden, Jan H. L.; Claxton, Raymond J.; Herrick, Joseph R.; and Ormesher, Robert J., 4,128,415, Cl. 75-65.00R.
Cleare, Peter J. V., to Imperial Chemical Industries Limited. Preparation of halogenated aldehydes. 4,128,585, Cl. 260-601.00H.
Clesid S.A.: *See—*
Maubon, Andre, 4,128,230, Cl. 266-89.000.
Clifford, Earl W.: *See—*
Sorce, Peter S.; and Clifford, Earl W., 4,128,451, Cl. 156-555.000.
Clitherow, John W.: *See—*
Price, Barry J.; Clitherow, John W.; and Bradshaw, John, 4,128,658, Cl. 424-285.000.
Coash, Ronald J., to Reinke Manufacturing Company. Wind correction method and apparatus for irrigation systems. 4,128,205, Cl. 239-1.000.
Coats Brothers & Company Ltd.: *See—*
O'Hara, Kevin J.; and Kilvington, Howard J., 4,128,436, Cl. 106-243.000.
Cobb, Sanford, Jr.: *See—*
Lowrey, Robert D.; Wegwerth, Arthur A.; Koeck, Donna M.; and Cobb, Sanford, Jr., 4,128,685, Cl. 428-212.000.
Cohen, A. David, to Imperial Oil Limited. Lewis acid-fluorine compounds of carbon. 4,128,499, Cl. 252-378.00R.
Coin Cop Co.: *See—*
Dautremont, Joseph L., Jr., 4,128,158, Cl. 194-100.00A.

Coldren, Kenneth M., to M & W Gear Company. Rocking bolster utilizing shock absorbers. 4,128,255, Cl. 280-143.000.

Coldren, Larry A.; and Lemons, Ross A., to Bell Telephone Laboratories, Incorporated. Micropositioners using a crystal having moveable domain walls. 4,128,616, Cl. 310-328.000.

Cole, Herbert S., Jr.; and Stein, Charles R., to General Electric Company. Liquid crystal display with dark characters on light background. 4,128,313, Cl. 350-340.000.

Cole, Herbert S., Jr.; and Aftergut, Siegfried, to General Electric Company. Dichroic liquid crystal compositions. 4,128,496, Cl. 252-299.000.

Cole, Herbert S., Jr.; and Aftergut, Siegfried, to General Electric Company. Dichroic liquid crystal compositions. 4,128,497, Cl. 252-299.000.

Cole, William M.: *See—*
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,128,710, Cl. 528-168.000.

Coleman, Clyde F.: *See—*
Allen, James A.; and Coleman, Clyde F., 4,128,247, Cl. 274-23.00R.

Coleman, Donald F.; and Rhodes, Sammy J., to Caterpillar Tractor Co. Travel alarm system. 4,128,827, Cl. 340-52.00R.

Colgate-Palmolive Company: *See—*
Bauman, Robert A.; and Kaeser, James A., 4,128,485, Cl. 252-8.800.

Collins, Melvin. Emergency bumper and bike rack. 4,128,195, Cl. 224-42.03B.

Colt Industries Operating Corp.: *See—*
Herman, Ronald E., 4,128,088, Cl. 123-119.0EC.

Columbia Ribbon and Carbon Manufacturing Co., Inc.: *See—*
Newman, Douglas A.; and Emerson, Robert T., 4,128,430, Cl. 106-31.000.

Colwell, David J., to Keep View Ltd. Waterbeds. 4,127,908, Cl. 5-370.000.

Combustion Engineering, Inc.: *See—*
Palmer, David N.; and Davison, John E., 4,128,486, Cl. 252-25.000.

Combustion Unlimited Incorporated: *See—*
Straitz, John F., III, 4,128,389, Cl. 431-202.000.
Straitz, John F., III, 4,128,734, Cl. 136-232.000.

Communications Technology Corporation: *See—*
Bernstein, Albert, 4,128,739, Cl. 179-1.0PC.

Compagnie Internationale pour l'Informatique Cii Honeywell Bull: *See—*
Vinot, Daniel, 4,128,899, Cl. 365-49.000.

Composite Container Corporation: *See—*
Bonis, Laszlo J., 4,128,381, Cl. 425-468.000.

Compton, Marshall F. Concrete control joint. 4,128,358, Cl. 404-47.000.

Compur-Electronic Gesellschaft mit beschrankter Haftung: *See—*
Muhlbock, Franz; Karpaty, Akos; and Pross, Wilhelm, 4,128,400, Cl. 422-101.000.

Computer Technology Limited: *See—*
Barron, Iann M.; and Wheeler, David J., 4,128,201, Cl. 235-304.000.

Conibear, Frank, to Woodstream Corporation. Trigger for rotating frame traps. 4,127,960, Cl. 43-92.000.

Continental Can Company, Inc.: *See—*
Saumsiegle, Robert W.; and Harry, Ieuan L., 4,128,374, Cl. 425-403.000.

Continental Oil Company: *See—*
Frohreich, Richard A.; and Scamehorn, John F., 4,128,405, Cl. 55-59.000.

Continental-Wirt Electronics Corporation: *See—*
Marsilio, Dominic O.; and O'Bryan, Edwin J., 4,128,745, Cl. 200-16.00C.

Cook, Jack E., Sr. Automatic levelling and locking ladder. 4,128,139, Cl. 182-202.000.

Cooper, Charles R., Jr.; Ellis, Charles K.; and Starcher, David. Self-propelled concrete vibrator apparatus. 4,128,359, Cl. 404-72.000.

Corbellini, Margherita; and Balducci, Agostino, to Snamprogetti, S.p.A. Process for the preparation of aluminum polymeric compounds of polyimine nature. 4,128,566, Cl. 260-448.00R.

Corbellini, Margherita; and Balducci, Agostino, to Snamprogetti, S.p.A. Aluminium polymeric compounds of polyimine nature. 4,128,567, Cl. 260-448.00R.

Corey, Bernard S., to McCullough, Foy; and Galbraith, Lyle D. Ring structure. 4,128,104, Cl. 135-3.00R.

Cormier, Arthur J.: *See—*
Parker, Bill B.; Beynand, Rudy; and Cormier, Arthur J., 4,128,108, Cl. 137-327.000.

Corning Glass Works: *See—*
Eldred, Emmet W.; and Schoemaker, Hubert J. P., 4,128,629, Cl. 424-1.000.
Simpson, William M., 4,128,697, Cl. 428-433.000.

Cory Food Services, Inc.: *See—*
Petry, Stanton H., 4,128,050, Cl. 99-304.000.

Coryell, Stanley W., to Classic Chemical. Throw-away can with integral closure and pull-up spout. 4,128,192, Cl. 222-525.000.

Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Mercapto phenolic and alkylthio phenolic antioxidants. 4,128,530, Cl. 260-45.95C.

Coyer, Howard F.: *See—*
Naylor, Robert; and Coyer, Howard F., 4,128,637, Cl. 424-95.000.

Coyne, Michael F.: *See—*
Chapel, James F., 4,128,407, Cl. 55-259.000.

Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., to Merck & Co., Inc. 9-Thia- and oxothia- and 9-dioxothia-11,12-seco-prostaglandins. 4,128,564, Cl. 260-401.000.

Cram, Donald J., to University of California, The Regents of the. Certain multioxymacrocycle compounds containing pyridyl as part of the macrocycle. 4,128,556, Cl. 546-26.000.

Cramer, Hugo: *See—*
Braun, Dieter; and Cramer, Hugo, 4,127,982, Cl. 57-294.000.

Cray Research, Inc.: *See—*
Cray, Seymour R., Jr., 4,128,880, Cl. 364-200.000.

Cray, Seymour R., Jr., to Cray Research, Inc. Computer vector register processing. 4,128,880, Cl. 364-200.000.

Creixell, Francisco B.: *See—*
Nothen, Karl; Creixell, Francisco B.; and Ehrig, Bodo, 4,127,945, Cl. 34-18.000.

Croon & Lucke Maschinenfabrik GmbH & Co. KG: *See—*
Lucke, Florian, 4,127,978, Cl. 53-585.000.

Crowley, Richard P.: *See—*
Underwood, Robert H., 4,128,215, Cl. 242-118.610.

Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Di Vita, Pietro, 4,128,302, Cl. 350-96.180.

Cucksee, Marjorie T.; and Allen, Henry C., to United States of America, Army. Solubility of NPGA in a polyurethane binder. 4,128,441, Cl. 149-19.920.

Cuneo, Joseph V.: *See—*
Ramos, Edward; and Cuneo, Joseph V., 4,128,836, Cl. 343-7.0PF.

Cupp, Charles D.; Matthies, Bruce J.; and Wood, Frederick J., Jr., to Shur-Line Manufacturing Co., Inc. Applicator with multi-positional handle. 4,127,911, Cl. 15-210.00R.

Curran, Roger J., to Bangor Punta Operations, Inc. Extractor assembly for rimless cartridges. 4,127,955, Cl. 42-68.000.

Cushman, David W.; and Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Reduction of blood pressure with carboxyalkylacyl-pipecolic acid derivatives. 4,128,653, Cl. 424-267.000.

Cuthbert, Victor W.: *See—*
Brenner, Robert A.; Cuthbert, Victor W.; and Braga, Albert T., 4,128,210, Cl. 241-46.00R.

D'Agostini, Candido: *See—*
Barba, Diego; D'Agostini, Candido; and Pasquinelli, Aldo, 4,128,457, Cl. 203-29.000.

Dai Nippon Toryo Co., Ltd.: *See—*
Hase, Takashi; Yoshikawa, Masatake; and Takanashi, Haruyuki, 4,128,498, Cl. 252-301.40F.

Daiko Iryoki Seisakusho Co., Ltd.: *See—*
Murata, Hiroshi, 4,128,797, Cl. 318-666.000.

Daiwa Kasei Kenkyujo Kabushiki Kaisha: *See—*
Nishimura, Hideo; Masaki, Seishi; Miyauchi, Takao; and Kobayashi, Nariyoshi, 4,128,460, Cl. 204-35.00N.

Dalessio, Frederick F.: *See—*
Johnson, Eugene C.; and Dalessio, Frederick F., 4,128,893, Cl. 364-900.000.

Damen, Theodoor C.: *See—*
Chang, Tao-Yuan; Damen, Theodoor C.; and Nguyen, Van-Tran, 4,128,772, Cl. 307-88.300.

Dana Corporation: *See—*
Sink, William H., 4,128,045, Cl. 91-217.000.

Danfoss A/S: *See—*
Basse, Tage S., 4,128,747, Cl. 200-67.00D.

Data General Corporation: *See—*
Doerre, George W., 4,128,866, Cl. 363-15.000.

Daude-Lagrave, Marie-Christine: *See—*
Schirmann, Jean-Pierre; Dubreux, Bernard; Bakes, Michel; Delavarenne, Serge-Yvon; and Daude-Lagrave, Marie-Christine, 4,128,494, Cl. 252-186.000.

Daunheimer, Lyn R., to Masonite Corporation. Apparatus for decorating embossed panels. 4,128,076, Cl. 118-70.000.

Dautremont, Joseph L., Jr., to Coin Cop Co. Precision coin analyzer for numismatic application. 4,128,158, Cl. 194-100.00A.

D'Autry, Eric Marteau. Adjustable diluting device. 4,128,009, Cl. 73-425.600.

Davis, James A., to Bell Telephone Laboratories, Incorporated. Rugged crosspoints for communication systems. 4,128,742, Cl. 179-18.0GF.

Davison, John E.: *See—*
Palmer, David N.; and Davison, John E., 4,128,486, Cl. 252-25.000.

Dawidowitsch, Peter: *See—*
Geyken, Erwin; and Dawidowitsch, Peter, 4,128,424, Cl. 96-63.000.

Deal, Douglas O.; and Morley, Robert C., to Sam Stein Associates, Inc. Leak free housing for vertical screw conveyor. 4,128,160, Cl. 198-657.000.

de Courten, Alfred: *See—*
Schulthess, Adrian; and de Courten, Alfred, 4,128,661, Cl. 424-316.000.

Deere & Company: *See—*
Bucher, David H.; and Meinert, Harry M., 4,128,131, Cl. 172-311.000.
Green, Robert V.; Wiley, Jack C.; and Arnold, Loren G., 4,128,130, Cl. 172-266.000.

Deffeyes, Kenneth S.: *See—*
Ghiringhelli, Hugh A.; and Deffeyes, Kenneth S., 4,128,462, Cl. 204-109.000.

Degen, Bruno: *See—*
Buchner, Werner; Degen, Bruno; Fries, Ludwig; Hclmut, Judat; Mundil, Rudolf; and Rudolph, Karl-Heinz, 4,128,568, Cl. 260-448.20E.

DeGuire, Marcel F.; and Wirag, John H., III, to Newmont Exploration Limited. Treatment of zinc calcines for zinc recovery. 4,128,617, Cl. 423-106.000.

Dehnert, Johannes; and Lamm, Gunther, to BASF Aktiengesellschaft.

Azo dyes with 2,6-diamino-pyridine coupling component. 4,128,545, Cl. 260-156.000.
Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., to Trico Products Corporation. Wiper blade. 4,127,912, Cl. 15-250.420.
Deigner, Paul: *See*—
Wunsch, Gerd; Deigner, Paul; Falk, Roland; Mahler, Karl; Loeser, Werner; Domas, Friedrich; Felleisen, Peter; and Steck, Werner, 4,128,672, Cl. 427-130.000.
Deiner, Hans: *See*—
Rossler, Erich; Deiner, Hans; Sandner, Bernhard; and Schilling, Hans, 4,128,675, Cl. 427-390.00E.
Deknatel Inc.: *See*—
Kurtz, Leonard D.; and Ludwig, Philip, 4,128,351, Cl. 128-305.000.
Delapp, Darwin F.: *See*—
Goebel, James C.; Delapp, Darwin F.; and Bunkowski, Kenneth D., 4,128,696, Cl. 428-424.000.
Delavan Corporation: *See*—
Bintner, Dennis W., 4,128,206, Cl. 239-11.000.
Delavarenne, Serge-Yvon: *See*—
Schirmann, Jean-Pierre; Dubreux, Bernard; Bakes, Michel; Delavarenne, Serge-Yvon; and Daude-Lagrave, Marie-Christine, 4,128,494, Cl. 252-186.000.
Del Bon, Luigi. Fountain brush. 4,128,349, Cl. 401-151.000.
Del Signore, James R., II, to NCR Corporation. Ambient light compensating circuit. 4,128,760, Cl. 250-214.00B.
deMauriac, Richard A.: *See*—
Knight, Phillip D.; deMauriac, Richard A.; and Graham, Patricia A., 4,128,557, Cl. 260-299.000.
Denka Chemical Corporation: *See*—
Fitzgerald, Kenneth D., 4,128,514, Cl. 260-17.00A.
Dennis, Jack B., to Massachusetts Institute of Technology. Packet memory system with hierarchical structure. 4,128,882, Cl. 364-200.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 4H-pyrazolo[1,5-a]pyrazolo[4',3':5,6]pyrido[3,4-e]pyrimidin-5(8H)one and derivatives thereof. 4,128,645, Cl. 424-251.000.
DePenti, Kenneth L.; and Metzger, William J., to Midland-Ross Corporation. Rotary type railway car coupler. 4,128,178, Cl. 213-62.00A.
Deuterium Corporation: *See*—
Spevack, Jerome S., 4,128,406, Cl. 55-237.000.
Deutsche Gold- und Silber- Scheideanstalt vormals Roessler: *See*—
Wolff, Siegfried; and Rothbuhr, Lothar, 4,128,438, Cl. 106-307.000.
Dexter, Martin: *See*—
Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, 4,128,718, Cl. 548-313.000.
Dhami, Kewal S.; Bennett, Elmer W.; and Burton, Pearl, to International Telephone and Telegraph Corporation. Wire coated with fluorocarbon blend. 4,128,693, Cl. 428-379.000.
Dhein, Rolf: *See*—
Eimers, Erich; Dhein, Rolf; and Wiedermann, Rolf, 4,128,532, Cl. 528-79.000.
Diamond Shamrock Corporation: *See*—
Alpert, Mel, 4,128,398, Cl. 8-127.600.
Magee, Thomas A., 4,128,581, Cl. 260-566.0AC.
Sieglaff, Charles L.; Hora, Charles J.; and Tiefenbach, Joseph P., 4,128,318, Cl. 351-160.00R.
Dillard, George M.: *See*—
Hunt, Barry R.; Dillard, George M.; and Taylor, Henry F., 4,128,759, Cl. 250-199.000.
Di Meo, Lino: *See*—
Lore, Nicola; and Di Meo, Lino, 4,128,285, Cl. 312-196.000.
Di Vita, Pietro, to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A. Ray-path equalizer for signal transmission via multimode optical waveguides. 4,128,302, Cl. 350-96.180.
Dobson, Thomas A.: *See*—
Asselin, Andre A.; Humber, Leslie G.; and Dobson, Thomas A., 4,128,560, Cl. 260-315.000.
Dr. Boy KG: *See*—
Jamann, Helmut, 4,128,380, Cl. 425-450.100.
Doerre, George W., to Data General Corporation. Power supply with current foldback. 4,128,866, Cl. 363-15.000.
Dohmeier, Hans O., to Dome Inventions (Proprietary) Limited. Method for embedding tire chains in the tread portion of a tire. 4,128,446, Cl. 156-114.000.
Dolak, Lester A.: *See*—
Sebek, Oldrich K.; and Dolak, Lester A., 4,128,563, Cl. 260-343.450.
Domas, Friedrich: *See*—
Wunsch, Gerd; Deigner, Paul; Falk, Roland; Mahler, Karl; Loeser, Werner; Domas, Friedrich; Felleisen, Peter; and Steck, Werner, 4,128,672, Cl. 427-130.000.
Dome Inventions (Proprietary) Limited: *See*—
Dohmeier, Hans O., 4,128,446, Cl. 156-114.000.
Domenico, Robert J., to Palyn Associates, Inc. Digitally controlled power system. 4,128,771, Cl. 307-52.000.
Domoto, Masahiro: *See*—
Oyamada, Takeo; Tomizawa, Choji; Domoto, Masahiro; and Narisawa, Shizuo, 4,128,518, Cl. 260-29.6WB.
Doppen, Glen M.: *See*—
Burness, Arnold M.; Ling, Hans G.; and Doppen, Glen M., 4,128,538, Cl. 260-884.000.
Dorais, Mark V., to Federal Screw Works. Voice synthesizer. 4,128,737, Cl. 179-1.0SM.
Dorkel, Jean: *See*—
Gansert, Willi; Bergfried, Dietrich; Heinrich, Gert; Schnepf, Dietmar; Slansky, Harry; Pfluger, Eberhard; and Dorkel, Jean, 4,128,802, Cl. 322-28.000.
Dorst-Keramikmaschinen-Bau Otto Dorst u. Dipl.-Ing. Walter Schlegel: *See*—
Schubart, Rolf R., 4,128,375, Cl. 425-405.00H.
Dow Chemical Co., The: *See*—
McKendry, Lennon H., 4,128,551, Cl. 546-293.000.
McKendry, Lennon H., 4,128,553, Cl. 546-293.000.
Dresser Industries, Inc.: *See*—
Golwas, Robert F.; and Feuerstein, Herman G., 4,128,361, Cl. 408-137.000.
Shepherd, Wilburn O.; and Gaslow, Jonathon C., 4,128,362, Cl. 415-112.000.
Dressler, Goldsmith, Clements, Gordon & Shore, Ltd.: *See*—
Marsh, Harold G.; and Pierret, James A., 4,128,421, Cl. 75-251.000.
Dubreucq, Jean-Claude: *See*—
Lejeune, Gerard; and Dubreucq, Jean-Claude, 4,128,806, Cl. 324-54.000.
Dubreux, Bernard: *See*—
Schirmann, Jean-Pierre; Dubreux, Bernard; Bakes, Michel; Delavarenne, Serge-Yvon; and Daude-Lagrave, Marie-Christine, 4,128,494, Cl. 252-186.000.
Duclos, Clovis R. Alignment device for golf clubs. 4,128,244, Cl. 273-164.000.
Du Corday, Gerard M. Magazine cover. 4,128,262, Cl. 281-34.000.
Duke, Jack R.; Shah, Niranjan S.; and Woolf, William C., to NCR Corporation. Shared busy means in a common bus environment. 4,128,883, Cl. 364-200.000.
Du Pont de Nemours, E. I., and Company: *See*—
Anolick, Colin, 4,128,698, Cl. 428-480.000.
Baker, Melvin C., 4,128,535, Cl. 528-272.000.
Fugitt, Robert B.; and Luckenbaugh, Raymond W., 4,128,654, Cl. 424-272.000.
Loos, Karl D., II; McCullough, Kenneth C.; and Whitworth, Don Q., 4,128,622, Cl. 423-376.000.
Dura Corporation: *See*—
Leaf, Ronn J., 4,128,355, Cl. 403-222.000.
Dyer, Paul N.; and Moseley, Fred, to Air Products and Chemicals, Inc. Synthesis of hydrogen peroxide. 4,128,627, Cl. 423-584.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Gawlick, Heinz; and Homburg, Axel, 4,128,060, Cl. 102-92.700.
Vollkommer, Norbert; Petersen, Egon N.; Klinkenberg, Herbert; and Schmidt, Werner, 4,128,709, Cl. 526-218.000.
Wissinger, Waldemar; and Webermeier, Kurt, 4,128,386, Cl. 425-462.000.
Dzugutov, Mikhail Y.: *See*—
Terekhov, Kuzma I.; Tumanov, Alexei T.; Ozerova, Alexandra P.; Topilin, Valentin V.; Dzugutov, Mikhail Y.; Ljubinskaya, Mara A.; Pashchnik, Gennady A.; Nikishov, Alexandr S.; and Ustinov, Terenty I., 4,128,419, Cl. 75-171.000.
E. R. Squibb & Sons, Inc.: *See*—
Breuer, Hermann; and Treuner, Uwe D., 4,128,723, Cl. 544-25.000.
Breuer, Hermann; and Treuner, Uwe D., 4,128,724, Cl. 544-30.000.
Cushman, David W.; and Ondetti, Miguel A., 4,128,653, Cl. 424-267.000.
Denzel, Theodor; and Hoehn, Hans, 4,128,645, Cl. 424-251.000.
Hoehn, Hans; Bernstein, Jack; and Vogt, B. Richard, 4,128,717, Cl. 544-361.000.
Ondetti, Miguel A., 4,128,721, Cl. 560-16.000.
Rovnyak, George C., 4,128,647, Cl. 424-251.000.
Rovnyak, George C., 4,128,648, Cl. 424-251.000.
Treuner, Uwe D., 4,128,716, Cl. 544-346.000.
Vogt, B. Richard, 4,128,644, Cl. 424-251.000.
Eastman Kodak Company: *See*—
Burness, Arnold M.; Ling, Hans G.; and Doppen, Glen M., 4,128,538, Cl. 260-884.000.
Fletcher, George L.; Wadsworth, Donald H.; and Jones, Jean E., 4,128,422, Cl. 96-48.0HD.
Knight, Phillip D.; deMauriac, Richard A.; and Graham, Patricia A., 4,128,557, Cl. 260-299.000.
Pond, David M.; and Wang, Richard H., 4,128,559, Cl. 260-308.00B.
Eaton Corporation: *See*—
Larson, Gerald L.; Treadwell, William A.; and Seaver, James, 4,128,044, Cl. 91-20.000.
Maltby, Edgar W., 4,128,203, Cl. 236-100.000.
Eckert, Lewis W.: *See*—
Barnett, David L.; Christie, Peter A.; and Eckert, Lewis W., 4,128,524, Cl. 260-39.00R.
Eckstein, Yona: *See*—
Reisfeld, Renata; Eckstein, Yona; and Boehm, Leah, 4,128,411, Cl. 65-18.000.
Ede, Douglas F. C., to Bondgrade Limited. Tooling jig. 4,128,118, Cl. 144-134.00D.
Edelman, Robert: *See*—
Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, 4,128,599, Cl. 260-857.00R.
Ehrig, Bodo: *See*—
Nothen, Karl; Creixell, Francisco B.; and Ehrig, Bodo, 4,127,945, Cl. 34-18.000.
Eimers, Erich; Dhein, Rolf; and Wiedermann, Rolf, to Bayer Aktiengesellschaft. Polyetheresters which contain hydroxyl groups and the use thereof in the production of flame resistant synthetic resins. 4,128,532, Cl. 528-79.000.

Elam, Richard C., to Gulf & Western Industries, Inc. Method and maskant composition for preventing the deposition of a coating on a substrate. 4,128,522, Cl. 260-32.80R.

Eldred, Emmet W.; and Schoemaker, Hubert J. P., to Corning Glass Works. Extraction-free cortisol assay. 4,128,629, Cl. 424-1.000.

Elfab Corporation: *See*—
Ammon, John P., 4,127,935, Cl. 29-629.000.

Elkins, Vance V., Jr., to Pratt-Read Corporation. Correlated set of golf clubs. 4,128,242, Cl. 273-77.00A.

Elliott, Charles. Combination tackle box, bait holder, cooler and seat means. 4,128,170, Cl. 206-315.00R.

Ellis, Charles K.: *See*—
Cooper, Charles R., Jr.; Ellis, Charles K.; and Starcher, David, 4,128,359, Cl. 404-72.000.

Elliston, Thomas L., to Hydra-Rig, Inc. Hoist apparatus with dual mast structure and compound power transmission system. 4,128,229, Cl. 254-139.000.

Emeott, Marvin: *See*—
Skinner, Earl; Emeott, Marvin; and Jevne, Allan, 4,128,600, Cl. 260-859.00R.

Emerson, Robert T.: *See*—
Newman, Douglas A.; and Emerson, Robert T., 4,128,430, Cl. 106-31.000.

Enatsu, Shachio, to Bristoline Inc. Fine-adjusting arrangement for a sphygmomanometer. 4,128,014, Cl. 73-729.000.

Engelhard Minerals & Chemicals Corporation: *See*—
Carr, William C.; Polinski, Leon M.; Hindin, Saul G.; and Kosco, James L., 4,128,591, Cl. 260-668.00A.

England, John M., to National Research Development Corporation. Methods and apparatus for analyzing frequency distributions. 4,128,884, Cl. 364-416.000.

English, George J.: *See*—
Levin, Robert E.; and English, George J., 4,128,333, Cl. 355-67.000.

Englund, Arvid E., Jr., to General Electric Company. Frequency indicating circuit. 4,128,811, Cl. 328-134.000.

Ennis, Robert E., to Linatex Corporation of America. Process for cleaning and dewatering fine coal. 4,128,474, Cl. 209-2.000.

Erickson, Norman; and Meier, James. Keyboard assembly. 4,128,035, Cl. 84-433.000.

Ermolovich, Eduard S.; and Olshvang, Mikhail V. Phase control arrangement of valve converter. 4,128,869, Cl. 363-87.000.

Ernest, Robert T., to National Steel Corporation. Method of removing excess liquid coating from web edges in liquid coating thickness control. 4,128,668, Cl. 427-349.000.

Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; and Schulz, Toni, to SKF Kugellagerfabriken GmbH. Linear motion ball bearings. 4,128,279, Cl. 308-6.00C.

Errede, Louis A.; and Sinclair, Robert A., to Minnesota Mining and Manufacturing Company. Sorbent foam material. 4,128,513, Cl. 521-50.000.

Erst, Frederick S.: *See*—
Bukowski, Raymond J.; and Erst, Frederick S., 4,128,758, Cl. 235-433.000.

Erwin Sick GmbH Optik-Elektronik: *See*—
Schreyer, Heinz B., 4,128,481, Cl. 250-202.000.

Erygin, Evgeny N.: *See*—
Ischenko, Vitaly G.; Shvetsov, Vladimir A.; Erygin, Evgeny N.; and Girshik, Roman L., 4,128,197, Cl. 225-97.000.

Eshelman, Donald M.: *See*—
Robinson, Victor S.; and Eshelman, Donald M., 4,128,619, Cl. 423-244.000.

Esper, Friedrich J.; and Zeller, Robert, to Robert Bosch GmbH. High-strength iron-molybdenum-nickel-phosphorus containing sintered alloy. 4,128,420, Cl. 75-230.000.

Esselborn, Reiner: *See*—
Baumer, Wilhelm; Bernhard, Horst; Esselborn, Reiner; Ohngemach, Jorg; Stahlecker, Otto; and Zureda, Fritz, 4,128,435, Cl. 106-148.000.

Etablissements Rene Guichard: *See*—
Guichard, Claude, 4,128,224, Cl. 248-316.00A.

Ethyl Corporation: *See*—
Governale, Luke J.; and Wollensak, John C., 4,128,582, Cl. 260-578.000.

Eue, Ludwig: *See*—
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,128,412, Cl. 71-90.000.

Euler, John W., to Lambert Brake Corporation. Combination failsafe brake and one-way clutch. 4,128,145, Cl. 188-71.200.

Euverard, Maynard R., to Velten & Pulver, Inc. Chain conveyor assembly. 4,128,165, Cl. 198-844.000.

Evans, Mark, to Kidde Consumer Durables Corp. Packaged light fixture. 4,128,171, Cl. 206-320.000.

Exxon Production Research Company: *See*—
Kaigler, Noyle B., Jr., deceased; Kaigler, Mary A., executrix; Hochstein, Spence L.; and Maple, James A., 4,128,219, Cl. 248-55.000.

Exxon Research & Engineering Co.: *See*—
Wiener, Charles; and Tyler, William E., III, 4,128,583, Cl. 260-584.00C.

Eysn, Manfred; and Moser, Hans, to Vereinigte Osterreichische Eisen- und Stahlwerke — Alpine Montan Aktiengesellschaft. Converter-bottom-fastening mechanism. 4,128,233, Cl. 266-243.000.

Fabel, David A.; Snelgrove, James A.; and Fariss, Robert H., to Monsanto Company. Laminates comprising a plasticized interlayer. 4,128,694, Cl. 428-412.000.

Fabre, Jean-Louis; Farge, Daniel; and James, Claude, to Rhone-Poulenc Industries. Dibenzo[de, h]quinoline derivatives. 4,128,650, Cl. 424-258.000.

Fairchild Camera and Instrument Corporation: *See*—
Vasa, Suresh L., 4,128,892, Cl. 364-900.000.

Fairley, John; Krickl, Josef; and Weber, Robert, to Kienzle Apparate GmbH. Apparatus for automatic reading and evaluation of graphs on trip recorder disks, and the like. 4,128,755, Cl. 235-92.00T.

Falk, Roland: *See*—
Wunsch, Gerd; Deigner, Paul; Falk, Roland; Mahler, Karl; Loeser, Werner; Domas, Friedrich; Felleisen, Peter; and Steck, Werner, 4,128,672, Cl. 427-130.000.

Farge, Daniel: *See*—
Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,128,650, Cl. 424-258.000.

Fariss, Robert H.: *See*—
Fabel, David A.; Snelgrove, James A.; and Fariss, Robert H., 4,128,694, Cl. 428-412.000.

Faserwerke Huls Gesellschaft mit beschrankter Haftung: *See*—
Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, 4,128,533, Cl. 528-279.000.
Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, 4,128,534, Cl. 528-279.000.

Fauth, Gunter: *See*—
Wick, Richard; Stemme, Otto; Lermann, Peter; and Fauth, Gunter, 4,128,323, Cl. 354-86.000.

Federal Paper Board Company, Inc.: *See*—
Arneson, Edwin L., 4,128,169, Cl. 206-141.000.

Federal Screw Works: *See*—
Dorais, Mark V., 4,128,737, Cl. 179-1.0SM.

Felder, Donald W. Brush and ring distributor. 4,128,746, Cl. 200-24.000.

Felleisen, Peter: *See*—
Wunsch, Gerd; Deigner, Paul; Falk, Roland; Mahler, Karl; Loeser, Werner; Domas, Friedrich; Felleisen, Peter; and Steck, Werner, 4,128,672, Cl. 427-130.000.

Felten & Guilleaume Kabelwerke GmbH: *See*—
Braun, Dieter; and Cramer, Hugo, 4,127,982, Cl. 57-294.000.

Fender, Ferdinand G.; and Tegethoff, Jon E., to Ni-Tec, Inc. Portable test apparatus for low light level devices. 4,128,340, Cl. 356-218.000.

Fenske, Steven L.: *See*—
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,128,710, Cl. 528-168.000.

Fenster, Abraham S.; and Salloga, Fred W., to United States Pipe and Foundry Company. Hydrant valve connection. 4,128,265, Cl. 285-305.000.

Fergg, Berthold; Hujer, Friedrich; and Zahn, Wolfgang, to Agfa-Gevaert AG. Evaluation and copying of originals arranged in a strip. 4,128,330, Cl. 355-32.000.

Ferguson, Hugo S. Crossflow mower with automatic brake/sharpener. 4,127,980, Cl. 56-11.300.

Ferris, William G.: *See*—
Brussee, Warren T.; and Ferris, William G., 4,128,864, Cl. 362-306.000.

Ferro, Armand P.; and Walker, Loren H., to General Electric Company. Core configuration for induction ionized lamps. 4,128,785, Cl. 315-57.000.

Festo-Maschinenfabrik Gottlieb Stoll: *See*—
Maier, Fred, 4,128,119, Cl. 144-317.000.

Feuerstein, Herman G.: *See*—
Golwas, Robert F.; and Feuerstein, Herman G., 4,128,361, Cl. 408-137.000.

Fiberglas Canada Limited: *See*—
Metcalfe, Paul E.; Rollo, Randall W.; and Stagg, Malcolm J., 4,128,678, Cl. 428-119.000.

Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., to Firestone Tire & Rubber Company, The. Process for the production of phosphazene polymers. 4,128,710, Cl. 528-168.000.

Fikentscher, Rolf: *See*—
Streit, Werner; Fikentscher, Rolf; Gans, Karl; and Welzel, Gerhard, 4,128,511, Cl. 528-424.000.

Finlayson, Thomas J., to Allis-Chalmers Corporation. Straddle-type lift truck with a apparatus for handling loads at the front and sides thereof. 4,128,183, Cl. 214-730.000.

Finley, Joseph H.; and Blumbergs, John H., to FMC Corporation. Phenyl sulfonate esters as peroxygen activators. 4,128,490, Cl. 252-95.000.

Firestone Tire & Rubber Company, The: *See*—
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,128,710, Cl. 528-168.000.

Fischbach, Wolfgang, to Heinrich Baumgarten Eisen- und Blechwarenfabrik. Handle for a pot. 4,127,914, Cl. 16-110.00A.

Fischer, Frederic P., II, to Calspan Corporation. Method and apparatus for transmitting facsimiles over telephone lines. 4,128,850, Cl. 358-284.000.

Fischer, Konrad, to Licentia Patent-Verwaltungs-G.m.b.H. Method of ion etching Cd-Hg-Te semiconductors. 4,128,467, Cl. 204-192.00E.

Fischer, Paul H.: *See*—
Lin, Tai-Shun; Fischer, Paul H.; Prusoff, William H.; and Shiau, George T., 4,128,639, Cl. 424-180.000.

Fischer & Porter Co.: *See*—
Hyams, Irving; Koch, Harold S.; and Aafjes, Herman C., 4,128,024, Cl. 81-3.800.

Fischetti, Frank, Jr.: *See*—
Kulka, Kurt; Mild, Frank; and Fischetti, Frank, Jr., 4,128,101, Cl. 131-17.00R.

Fitzgerald, Kenneth D., to Denka Chemical Corporation. Stable polychloroprene latex. 4,128,514, Cl. 260-17.00A.

Flaten, James F., to Tobin-Arp Manufacturing Company. Method and apparatus for reconditioning cylinder heads. 4,127,942, Cl. 33-181.0AT.

Fleischer, Henry. Support frames adapted for use with car seats and beds. 4,127,907, Cl. 5-94.000.

Fletcher, George L.; Wadsworth, Donald H.; and Jones, Jean E., to Eastman Kodak Company. Cyclopropenone vesicular imaging composition, element and process. 4,128,422, Cl. 96-48.0HD.

Flisikowski, Peter; and Peemoller, Horst, to U.S. Philips Corporation. X-ray tube. 4,128,781, Cl. 313-60.000.

Flynn, Patrick F.: *See—*
Wise, Lawrence D.; Flynn, Patrick F.; and Morrison, Glenn C., 4,128,552, Cl. 546-294.000.

FMC Corporation: *See—*
Finley, Joseph H.; and Blumbergs, John H., 4,128,490, Cl. 252-95.000.

Foa, Marco: *See—*
Cassar, Luigi; and Foa, Marco, 4,128,572, Cl. 562-406.000.

Follett, John L. Automatic shut-off valve and method of operation thereof. 4,128,105, Cl. 137-1.000.

Formanik, Bert J., to TRW Inc. Method for stripping tungsten carbide from titanium or titanium alloy substrates. 4,128,463, Cl. 204-146.000.

Formax, Inc.: *See—*
Sandberg, Glenn A., 4,128,164, Cl. 198-813.000.

Formica Corporation: *See—*
Goebel, James C.; Delapp, Darwin F.; and Bunkowski, Kenneth D., 4,128,696, Cl. 428-424.000.

Formica International Limited: *See—*
Heaps, John M.; and Lu, Chisen, 4,128,689, Cl. 428-311.000.

Formica Limited: *See—*
King, Peter G., 4,128,284, Cl. 312-330.00R.

Forster, Siegfried; and Kleemann, Manfred, to Kernforschungsanlage Julich Gesellschaft m.beschrankter Haftung. Apparatus for support of sheet-metal-type heat exchanger matrices for recuperative heat exchange. 4,128,126, Cl. 165-165.000.

Foster, Richard C.: *See—*
Scott, John P.; Peters, Dudley C.; and Foster, Richard C., 4,128,800, Cl. 322-28.000.

Fotis, Peter: *See—*
Kildahl, Nicholas K.; and Fotis, Peter, 4,128,502, Cl. 252-431.00R.

Fraas, Lewis M.; Zanio, Kenneth R.; and Knechtli, Ronald C., to Hughes Aircraft Company. Multijunction gallium aluminum arsenide-gallium arsenide-germanium solar cell and process for fabricating same. 4,128,733, Cl. 136-89.0SJ.

Frank, Robert I.: *See—*
Kaplow, Roy; and Frank, Robert I., 4,128,732, Cl. 136-89.0PC.

Franks, Joseph. Ion beam machining techniques and apparatus. 4,128,765, Cl. 250-442.000.

Fransen, Jan J. B.; and Rimmelzwaan, Franciscus J., to U.S. Philips Corporation. Getter holder and electric discharge tube comprising such a holder. 4,128,782, Cl. 313-174.000.

Franzl, Gertrude K. Burglar-resistant door assembly. 4,127,967, Cl. 49-171.000.

Frase, Roland J.; Meitl, Harold G.; and McNaull, Tom M., to International Harvester Company. Collector for a pneumatic dispenser. 4,128,191, Cl. 222-167.000.

Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees, The Stoneleigh Trust: *See—*
Massa, Frank, 4,128,370, Cl. 425-128.000.

Frederiksen, Thomas M.; and Cecil, James B., to National Semiconductor Corporation. Voltage translator for interfacing TTL and CMOS circuits. 4,128,775, Cl. 307-264.000.

Frenz, Norbert W., Jr.: *See—*
Mead, Ralph T.; Greatbatch, Wilson; Rudolph, Frank W.; and Frenz, Norbert W., Jr., 4,128,703, Cl. 429-101.000.

Freund, Peter: *See—*
Angerer, Dieter; Freund, Peter; Hansel, Werner; and Wilhelm, Fritz, 4,128,453, Cl. 159-16.00S.

Frey, Frederick J., to InterRoyal Corporation. Tambour door and housing assembly. 4,128,120, Cl. 160-191.000.

Freze, Benjamin H., to Challenge-Cook Bros., Inc. Geyseric burner assembly and method for combusting fuels. 4,128,388, Cl. 431-116.000.

Fries, Ludwig: *See—*
Buchner, Werner; Degen, Bruno; Fries, Ludwig; Helmut, Judat; Mundil, Rudolf; and Rudolph, Karl-Heinz, 4,128,568, Cl. 260-448.20E.

Frisbie, Milo W.; and Swapp, Mavin C., to Motorola, Inc. High-speed integrated circuit handler. 4,128,174, Cl. 209-573.000.

Frisque, Alvin J.; and McDermott, Arthur R., to Nalco Chemical Company. Clay-polymer concentrates for beneficiating clays. 4,128,528, Cl. 260-42.550.

Fritsch, Thomas R.; and Anderson, Mark C., to UOP Inc. Production and recovery of para-cymene. 4,128,593, Cl. 260-674.00A.

Fritz Buser AG Maschinenfabrik: *See—*
Voegelin, Heinrich, 4,128,154, Cl. 192-67.00P.

Fritz Keiper KG, Firma: *See—*
Kluting, Bernd; and Voss, Hans W., 4,128,225, Cl. 248-421.000.

Fritzmeier AG: *See—*
Tschursch, Arnold, 4,128,152, Cl. 192-43.100.

Fritzsche Dodge & Olcott Inc.: *See—*
Kulka, Kurt; Mild, Frank; and Fischetti, Frank, Jr., 4,128,101, Cl. 131-17.00R.

Frohreich, Richard A.; and Scamehorn, John F., to Continental Oil Company. Incomplete drying of activated carbon in a process for VCM reduction in vapors. 4,128,405, Cl. 55-59.000.

Fuchs, Ernst E., to Mecafina S.A. Shearing devices. 4,128,027, Cl. 83-198.000.

Fugitt, Robert B.; and Luckenbaugh, Raymond W., to Du Pont de Nemours, E. I., and Company. 5-Halomethyl-3-phenyl-2-oxazolidinones. 4,128,654, Cl. 424-272.000.

Fuji Photo Film Co., Ltd.: *See—*
Hiratsuka, Nobuo; and Yaginuma, Nakatsugu, 4,128,470, Cl. 204-299.00R.
Idota, Yoshio, 4,128,464, Cl. 204-151.000.
Ikenoue, Shinpei; Masuda, Takao; Suzuki, Nobuo; Tanaka, Toshiharu; and Sashihara, Kenji, 4,128,428, Cl. 96-114.100.
Shirahata, Ryuji; Kitamoto, Tatsuji; and Suzuki, Masaaki, 4,128,691, Cl. 428-336.000.
Watanabe, Kenzi; and Fujiyama, Masaaki, 4,128,673, Cl. 427-130.000.

Fujikake, Kenji; Katagiri, Haruo; and Yamada, Katsuhito, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Axial flow fan. 4,128,363, Cl. 416-236.00A.

Fujisaki, atsumi: *See—*
Wada, Ryoichi; Fujisaki, atsumi; Nakajima, Masaya; Tsunoo, Masahiko; and Kimura, Takeji, 4,128,032, Cl. 84-1.010.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kurita, Masaru; Jomon, Kazuyoshi; Komori, Tadaaki; Nakatani, Isami; and Tsuji, Masahiro, 4,128,546, Cl. 260-239.00A.

Fujitsu Limited: *See—*
Tanaka, Akira; Hayashi, Yuji; Kassai, Makoto; and Hara, Toshito, 4,128,823, Cl. 335-196.000.

Fujiyama, Masaaki: *See—*
Watanabe, Kenzi; and Fujiyama, Masaaki, 4,128,673, Cl. 427-130.000.

Fukunaga, Hajime: *See—*
Kishida, Kazuo; Kobayashi, Jinpee; and Fukunaga, Hajime, 4,128,605, Cl. 260-876.00R.

Fukuyama, Yoshiya: *See—*
Ura, Shigeru; Kondo, Norio; Fukuyama, Yoshiya; and Nakahara, Makoto, 4,128,437, Cl. 106-287.240.

Fuller Company: *See—*
Tock, Wilfred H., 4,128,392, Cl. 432-58.000.

Funatsuki, Genuemon: *See—*
Ishida, Shiro; Funatsuki, Genuemon; Izaiku, Hiromi; and Hirano, Jiro, 4,128,483, Cl. 252-8.600.

Furukawa, Yoshitaka: *See—*
Kawaguchi, Hitoshi; and Furukawa, Yoshitaka, 4,128,815, Cl. 331-94.50H.

Furutachi, Kunio; Kato, Akifumi; Nakagawa, Mikio; Nakano, Masaru; Arita, Shunji; and Yamamoto, Aikich, to Mitsui Petrochemical Industries, Ltd. Impact-resistant chemically blended propylene polymer composition and process for preparation thereof. 4,128,606, Cl. 260-878.00B.

G. E. Schlup & Co.: *See—*
Schlup, Gustave E.; and Berger, Edwin, 4,127,936, Cl. 29-721.000.

Gaensbauer, Herbert A.: *See—*
Herzog, Gordon W.; and Gaensbauer, Herbert A., 4,128,792, Cl. 318-706.000.

Gaensslen, Fritz H., to International Business Machines Corporation. Fabrication method for integrated circuits with polysilicon lines having low sheet resistance. 4,128,670, Cl. 427-86.000.

GAF Corporation: *See—*
Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., 4,128,520, Cl. 260-29.70W.
Brodsky, Lee; Lorenz, Donald H.; Nelsen, Suzanne B.; and Tu, Shu T., 4,128,536, Cl. 427-54.000.
Lorenz, Donald H.; and Williams, Earl P., 4,128,633, Cl. 424-80.000.

Gaiser, Dieter; Woellhaf, Josef; Schoettle, Klaus; Guenther, Friedrich; Kamm, Eugen; and Wendt, Erich, to BASF Aktiengesellschaft. Method of manufacturing and loading magnetic tape cassettes, particularly compact cassettes. 4,127,925, Cl. 29-430.000.

Gaither, Howard H.; and Casaleggi, Charles J., to Champion Laboratories, Inc. Sealing gasket for air filter. 4,128,251, Cl. 277-233.000.

Galbraith, Lyle D.: *See—*
Corey, Bernard S., 4,128,104, Cl. 135-3.00R.

Galinke, Joachim: *See—*
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,128,634, Cl. 424-81.000.
Hase, Brigitte; Hase, Christian; Galinke, Joachim; and Wegemund, Bernd, 4,128,635, Cl. 424-81.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,128,636, Cl. 424-81.000.

Gallery, Thomas W. Compact transmission line loudspeaker system. 4,128,738, Cl. 179-1.00E.

Gamache, Robert J. Applicator attachment. 4,128,350, Cl. 401-208.000.

Gamble, Edward B., to RCA Corporation. D-C converter using pulsed resonant circuit. 4,128,868, Cl. 363-26.000.

Gane, Gordon R., to Kaiser Aluminum & Chemical Corporation. Easy open end. 4,128,186, Cl. 220-268.000.

Gans, Karl: *See—*
Streit, Werner; Fikentscher, Rolf; Gans, Karl; and Welzel, Gerhard, 4,128,511, Cl. 528-424.000.

Gansert, Willi; and Rittmannsberger, Norbert, to Robert Bosch GmbH. Voltage regulator structure for automotive-type generators. 4,128,801, Cl. 322-28.000.

Gansert, Willi; Bergfried, Dietrich; Heinrich, Gert; Schnepf, Dietmar; Slansky, Harry; Pfluger, Eberhard; and Dorkel, Jean, to Robert

Bosch GmbH. Solid state voltage regulated automotive-type electrical power supply system. 4,128,802, Cl. 322-28.000.
Garcea, Giampaolo, to Alfa Romeo S.p.A. Automatic device for controlling the pressure of the intake air of an I.C. engine as its operating altitude varies. 4,128,086, Cl. 123-75.00D.
Gardner-Denver Company: *See*—
Mitchhart, Ray M.; and Zingl, Hans, 4,128,135, Cl. 175-52.000.
Gardner, Harry N., to Motorola, Inc. Recirculating memory with plural input-output taps. 4,128,879, Cl. 365-73.000.
Garner, Dudley E., Jr. Customer initiated ordering system. 4,128,757, Cl. 235-383.000.
Garnett, Kenneth J.: *See*—
Pohio, James N.; Richards, Douglas E.; Robertson, Angus A. J.; Williams, William; and Garnett, Kenneth J., 4,127,917, Cl. 17-21.000.
Garrett Corporation, The: *See*—
Bons, Robert; and Kitaguchi, Sam S., 4,128,769, Cl. 290-52.000.
Garriss, Daniel E.: *See*—
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Valek, Robert J.; and Gartner, Todd H., 4,128,885, Cl. 364-424.000.
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Gasser, Hermann, to Luwa AG. Apparatus for feeding a textile fiber band composed of staple fibers. 4,127,920, Cl. 19-236.000.
Gawlick, Heinz; and Homburg, Axel, to Dynamit Nobel Aktiengesellschaft. Short-range projectile for practice ammunition. 4,128,060, Cl. 102-92.700.
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Gay, Derek J.: *See*—
Goy Yu Chin, Manuel; and Gay, Derek J., 4,127,948, Cl. 35-60.000.
Gebruder Junghans GmbH: *See*—
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Mueller, Roman; and Kalapos, Josef, 4,128,052, Cl. 99-516.000.
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Baliga, Bantval J., 4,128,440, Cl. 148-171.000.
Bigelow, John E., 4,128,787, Cl. 315-169.0TV.
Borman, Willem F. H., 4,128,526, Cl. 260-40.00R.
Brussee, Warren T.; and Ferris, William G., 4,128,864, Cl. 362-306.000.
Castonguay, Roger N.; Jencks, Charles L.; and Turton, Robert C., 4,128,750, Cl. 200-308.000.
Cole, Herbert S., Jr.; and Stein, Charles R., 4,128,313, Cl. 350-340.000.
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Ferro, Armand P.; and Walker, Loren H., 4,128,785, Cl. 315-57.000.
Haberl, John B.; and Ozolins, Janis, 4,128,335, Cl. 356-37.000.
Irwin, John M.; and Schlereth, Fritz H., 4,128,890, Cl. 364-724.000.
Katchman, Arthur; and Lee, Gim F., Jr., 4,128,602, Cl. 260-876.00R.
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Klopfer, Howard J.; and Campbell, John R., 4,128,731, Cl. 568-726.000.
Lafferty, James M., 4,128,748, Cl. 200-144.00B.
Markezich, Ronald L.; and Takekoshi, Tohru, 4,128,574, Cl. 562-473.000.
Norton, James F.; Parks, Harold G.; and Possin, George E., 4,128,897, Cl. 365-118.000.
Owen, Daniel V., 4,128,789, Cl. 315-209.00R.
Russell, Ronald R., 4,128,804, Cl. 324-28.0CB.
Ryan, Edward W.; and Israel, George H., Jr., 4,128,208, Cl. 239-265.390.
Sigsbee, Raymond A., 4,128,121, Cl. 164-46.000.
Sterling, Vaughn C.; and Schupp, Lewis J., 4,128,858, Cl. 362-13.000.
Svec, Paul S., 4,128,431, Cl. 106-38.350.
Zgraggen, Martin A., 4,128,777, Cl. 310-45.000.
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Rose, Larry E.; and Lawrence, Norman F., 4,128,372, Cl. 425-311.000.
General Mills Chemicals, Inc.: *See*—
Lundmark, Larry D.; Melby, Allan; and Chun, Ho-Ming, 4,128,631, Cl. 424-70.000.
MacKay, Kenneth D.; and Rogier, Edgar R., 4,128,493, Cl. 252-184.000.
Skinner, Earl; Emeott, Marvin; and Jevne, Allan, 4,128,600, Cl. 260-859.00R.
General Motors Corporation: *See*—
Hegedus, Louis; and Summers, Jack C., 4,128,506, Cl. 252-466.0PT.
Smith, George W.; Kaplit, Michael; and Hayden, Daniel B., 4,128,311, Cl. 350-331.000.
General Tire & Rubber Co., The: *See*—
Britton, James E.; Metcalf, Fredric D.; Sommer, John G.; Kuan, Tiong H.; Rilling, Victor R.; and Welch, John A., 4,128,523, Cl. 260-33.6AQ.
Generoux, Robert E., to Lamage Limited. Drill bit. 4,128,136, Cl. 175-330.000.
Geo Space Corporation: *See*—
McNeel, William O., 4,128,220, Cl. 248-60.000.
George, Peter K.; Gergis, Isoris S.; and Kobayashi, Tsutomu, to Rockwell International Corporation. One-level switch for magnetic bubble domain devices. 4,128,896, Cl. 365-12.000.
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George, Peter K.; Gergis, Isoris S.; and Kobayashi, Tsutomu, 4,128,896, Cl. 365-12.000.
Gerhart, James P. Transition attachment for a core-spacer-core mandrel loader. 4,128,155, Cl. 193-46.000.
Gersbacher, Harry C., to United Aircraft Products, Inc. Braze fixture. 4,128,235, Cl. 269-234.000.
Geschonke, Hans; Rompeltien, Rainer; and Rummel, Wolfgang, to Wacker-Chemie GmbH. Process for the gentle degasification of coagulation-sensitive PVC latices. 4,128,516, Cl. 260-29.60R.
Geyken, Erwin; and Dawidowitsch, Peter, to Agfa-Gevaert AG. Method for treating photographic processing fluids prior to sewering thereof. 4,128,424, Cl. 96-63.000.
Ghiringhelli, Hugh A.; and Deffeyes, Kenneth S. Electrochemical process for recovering precious metals from their ores. 4,128,462, Cl. 204-109.000.
Giacobello, Bartolo J., to National Starch and Chemical Corporation. Method for drying water-absorbent compositions. 4,127,944, Cl. 34-9.000.
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Brands, Antoon H.; and Gietema, Jouke, 4,128,838, Cl. 343-55.00C.
Gilbert, C. Keith. Bale loader. 4,128,179, Cl. 214-1.0HH.
Gilbert, William C., to Celanese Corporation. Halogenated aromatic polyester fibers prepared via dry-spinning having reduced spin-line static generation. 4,128,614, Cl. 264-205.000.
Gilberts, Alexander G., to Reliable Electric Company. Surge arrester. 4,128,855, Cl. 361-119.000.
Giller, Henricus F. J. I.; and T'Jampens, Germain R., to U.S. Philips Corporation. Tungsten/bromine cycle lamp. 4,128,783, Cl. 313-174.000.
Gillette Company, The: *See*—
Joyce, Michael F., 4,128,172, Cl. 206-352.000.
Gillis, Richard W.: *See*—
Myerson, Elliott L.; and Gillis, Richard W. 4,128,034, Cl. 84-318.000.
Girshik, Roman L.: *See*—
Ischenko, Vitaly G.; Shvetsov, Vladimir A.; Erygin, Evgeny N.; and Girshik, Roman L., 4,128,197, Cl. 225-97.000.
Gist-Brocades N.V.: *See*—
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Gittins, Marvin W.: *See*—
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Givens, Edwin N.: *See*—
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Gladyshev, Georgy P.: *See*—
Shustova, Olga A.; Gladyshev, Georgy P.; Kondrashov, Eduard K.; and Shustov, Leonid D., 4,128,707, Cl. 526-43.000.
Glaxo Laboratories Limited: *See*—
Sharp, Christopher J., 4,128,715, Cl. 544-22.000.
Glory Kogyo Kabushiki Kaisha: *See*—
Asami, Kazuto; and Matono, Hirokuni, 4,128,102, Cl. 133-1.00A.
Goebel, James C.; Delapp, Darwin F.; and Bunkowski, Kenneth D., to Formica Corporation. Low pressure melamine resin laminates. 4,128,696, Cl. 428-424.000.
Gold, Robert L.: *See*—
Bilinsky, Michael C.; and Gold, Robert L., 4,128,097, Cl. 128-165.000.
Golwas, Robert F.; and Feuerstein, Herman G., to Dresser Industries, Inc. Locking means for positive feed drill. 4,128,361, Cl. 408-137.000.
Gomi, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Voltage controlled oscillator with phase control circuits. 4,128,817, Cl. 331-177.00R.
Goodyear Tire & Rubber Company, The: *See*—
Cottman, Kirkwood S., 4,128,530, Cl. 260-45.95C.
Goto, Kazuo: *See*—
Toyoda, Shinichi; Sakai, Masahiko; Goto, Kazuo; Narahara, Toshikazu; and Karasawa, Yoshiharu, 4,128,531, Cl. 528-53.000.
Governale, Luke J.; and Wollensak, John C., to Ethyl Corporation. Chemical process. 4,128,582, Cl. 260-578.000.
Gowans, Neil A.: *See*—
Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., 4,127,912, Cl. 15-250.420.
Goy Yu Chin, Manuel; and Gay, Derek J., to Mattel, Inc. Play desk. 4,127,948, Cl. 35-60.000.
Grabow, Ronald D., to Bunker Ramo Corporation. Packaging of pressure sensor cells. 4,128,006, Cl. 73-724.000.
Graham, Patricia A.: *See*—
Knight, Phillip D.; deMauriac, Richard A.; and Graham, Patricia A., 4,128,557, Cl. 260-299.000.

Granges Essem Aktiebolag Fack: *See*—
Paitula, Hannu O., 4,128,261, Cl. 280-744.000.
Grant, Norman H.: *See*—
Sarantakis, Dimitrios; and Grant, Norman H., 4,128,541, Cl. 260-112.50R.
Grassl, Reinhold. Tool changer apparatus. 4,128,043, Cl. 90-11.00D.
Gravel, Joseph A. M., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Laser micromachining apparatus. 4,128,752, Cl. 219-121.00L.
Graves, Daniel F.: *See*—
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,128,710, Cl. 528-168.000.
Gray, Archie B. Energy storage and transmission apparatus. 4,128,020, Cl. 74-572.000.
Gray, Rodger. Reconditioning panel for the floors of pick-up truck cargo boxes and cargo vans. 4,128,271, Cl. 296-39.00R.
Graziano, Victor, to Motorola, Inc. Antenna array for a cellular RF communications system. 4,128,740, Cl. 179-2.0EB.
Greatbatch, Wilson: *See*—
Mead, Ralph T.; Greatbatch, Wilson; Rudolph, Frank W.; and Frenz, Norbert W., Jr., 4,128,703, Cl. 429-101.000.
Green, Edward N. Display rack. 4,128,176, Cl. 211-45.000.
Green, Robert V.; Wiley, Jack C.; and Arnold, Loren G., to Deere & Company. Tool support. 4,128,130, Cl. 172-266.000.
Green, Talmage O., to Snap-on Tools Corporation. Measuring meter pointer assembly. 4,127,928, Cl. 29-453.000.
Greenwald, Harry; and Larkin, Dennis J., to Walter Kidde & Company, Inc. Anti-slug mechanism for a coin operated device. 4,128,156, Cl. 194-61.000.
Greenwald, Richard B., to Polaroid Corporation. Photographic developers. 4,128,425, Cl. 96-66.0HD.
Gregory, Frank. Method and apparatus for determining the orientation of a core cut in a bore hole. 4,128,134, Cl. 175-44.000.
Grenadier, Lewis. Solid molded paddle construction. 4,128,239, Cl. 273-67.00R.
Greten, Ernst, to Bison-werke Bahre & Greten GmbH & Co. KG. Continuously operating rough or finishing press. 4,128,373, Cl. 425-371.000.
Grimmett, Howard L.: *See*—
Hwang, Yu-Tang; and Grimmett, Howard L., 4,128,500, Cl. 252-430.000.
Grinnell Fire Protection Systems Company, Inc.: *See*—
Mears, James W., 4,128,128, Cl. 169-37.000.
Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Transmission mechanisms for vehicles. 4,128,151, Cl. 192-4.00A.
Grosso, Vincent G.; and Hillard, Ray L., to American Cyanamid Company. Process for the preparation of aryl esters of 3,5-di-t-butyl-4-hydroxybenzoic acid. 4,128,726, Cl. 560-72.000.
Grotta, Henry M.: *See*—
Wyant, Robert E.; and Grotta, Henry M., 4,128,429, Cl. 106-15.00R.
Gruber, Vincent A. Post mix soft drink dispenser. 4,128,190, Cl. 222-129.200.
GTE Laboratories Incorporated: *See*—
McKinzie, Howard; Wrighton, Mark S.; and Lester, Joseph, 4,128,704, Cl. 429-111.000.
GTE Sylvania Incorporated: *See*—
Hedler, Robert A., 4,128,674, Cl. 427-218.000.
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Guenther, Friedrich: *See*—
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Guichard, Claude, to Etablissements Rene Guichard. Support device for displaying spectacles. 4,128,224, Cl. 248-316.00A.
Gulf Oil Corporation: *See*—
Bacon, Kenneth H., 4,128,410, Cl. 62-40.000.
Gulf Research & Development Company: *See*—
Malone, Huey P.; Paraskos, John A.; and Taylor, Herman, Jr., 4,128,471, Cl. 208-8.000.
Sabourin, Edward T.; and Selwitz, Charles M., 4,128,588, Cl. 260-645.000.
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Elam, Richard C., 4,128,522, Cl. 260-32.80R.
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Shakula, Nikolai M.; Voloschenko, Nikolai I.; Shishkin, Nikolai F.; Muratov, Anatoly S.; Guzchenko, Alexandr P.; Anokhin, Vladimir M.; and Nikitchenko, Vladimir F., 4,128,367, Cl. 425-11.000.
H.A. Schlatter AG: *See*—
Knobloch, Johannes F.; and Brunner, Ernst, 4,128,870, Cl. 363-141.000.
Haberl, John B.; and Ozolins, Janis, to General Electric Company. Condensation nuclei counter with automatic ranging. 4,128,335, Cl. 356-37.000.
Habermann, Helmut; Brunet, Maurice; and Joly, Pierre, to Societe Europeene de Propulsion. Device for damping the critical frequencies of a rotor suspended by a radial electromagnetic bearing. 4,128,795, Cl. 318-618.000.
Hack, Helmuth: *See*—
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,128,412, Cl. 71-90.000.
Hadfield, Harry R.; Sumner, Harry H.; and Williams, Gerald, to Imperial Chemical Industries Limited. Transfer printing with carboxylic dyes. 4,128,395, Cl. 8-2.50A.
Hagedorn, Ilse, to Merck Patent Gesellschaft mit beschrankter Haftung. Bis-quaternary pyridinium-2-aldoxime salts and a process for their preparation. 4,128,651, Cl. 424-263.000.
Hall, Charles M.; and Wright, John B., to Upjohn Company, The. Anti-allergic oxanil compounds. 4,128,570, Cl. 260-465.00D.
Hall, Charles M.; and Wright, John B., to Upjohn Company, The. Anti-allergic aminooxanilic acids and esters. 4,128,660, Cl. 424-309.000.
Hall, Michael J.: *See*—
Atherton, Frank R.; Hall, Michael J.; Hassall, Cedric H.; Lambert, Robert W.; and Ringrose, Peter S., 4,128,542, Cl. 260-112.50R.
Halstead, Kenneth G.; and Willis, Thomas G., to Westinghouse Electric Corp. Multi-dial electric meter register. 4,128,807, Cl. 324-116.000.
Hammond Corporation: *See*—
Sauvey, Donald R.; and Magnuson, Robert E., 4,128,036, Cl. 84-441.000.
Haney, C. Rex. Animal feeder. 4,128,080, Cl. 119-51.500.
Hansel, Werner: *See*—
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Hansen, George E.; and Stvan, Richard T. Wafer swing check valves. 4,128,111, Cl. 137-515.700.
Hansen, Karl A.; and Hendrickson, I. Glen, to Boeing Company, The. Method of making work coil for an electromagnetic dent remover. 4,127,933, Cl. 29-605.000.
Hansen, Otto A. H., to O.A.H. Homes (Proprietary) Ltd. Tipping vehicle. 4,128,275, Cl. 298-19.00B.
Hanson, Marlin M.: *See*—
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Hara, Toshito: *See*—
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Harato, Takuo: *See*—
Yamada, Koichi; Harato, Takuo; Ishida, Takahiro; and Shiozaki, Yasumi, 4,128,618, Cl. 423-119.000.
Harbil, Inc.: *See*—
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Hardin, Dick K.: *See*—
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Harding, Geoffrey L.; McKenzie, David R.; and Window, Brian, to University of Sydney, The. Method and apparatus for reactive sputtering. 4,128,466, Cl. 204-192.00C.
Hardtmann, Goetz E., to Sandoz, Inc. 4-Hydroxy-pyrido[2,3-b]pyridine-2(1H)-one-3-carboxylic acids and esters. 4,128,649, Cl. 424-256.000.
Harless, Charles E.; and Taylor, Ward G., to United States of America, Energy. Tool for cutting insulation from electrical cables. 4,127,937, Cl. 30-90.700.
Harper, Homer C., III: *See*—
Chapel, James F., 4,128,407, Cl. 55-259.000.
Harrison, Charles W.; and Bozeman, Paul P., Jr., deceased (by Bozeman, Arlene, executrix), to Texaco Inc. Solvent dewaxing process. 4,128,472, Cl. 208-33.000.
Harry, Ieuan L.: *See*—
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Hart, William A., to United States of America, Air Force. Double plug shuttle valve. 4,128,113, Cl. 137-627.500.
Hartitz, Joachim E.; Nehemy, Sam D.; and Wahl, Erwin R., to B. F. Goodrich Company, The. Apparatus for processing extruded thermoplastic polymer. 4,128,379, Cl. 425-446.000.
Hartman, Adrian R.; Melchior, Hans; Schinke, David P.; and Smith, Richard G., to Bell Telephone Laboratories, Incorporated. Method of fabricating silicon photodiodes. 4,127,932, Cl. 29-590.000.
Hartz, George R.: *See*—
Windisch, Robert E.; and Hartz, George R., 4,128,286, Cl. 312-234.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Cosmetic emulsions containing copolymers of alkyl(meth)acrylates and mono-(N-hydroxyalkyl) or bis-(N-hydroxyalkyl) (meth)acrylamides. 4,128,634, Cl. 424-81.000.
Hase, Brigitte; Hase, Christian; Galinke, Joachim; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Cosmetic emulsions containing copolymers of alkyl (meth) acrylates and mono- or polyhydroxyalkyl (meth) acrylates. 4,128,635, Cl. 424-81.000.
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Hase, Christian: *See*—
Hase, Brigitte; Hase, Christian; Galinke, Joachim; and Wegemund, Bernd, 4,128,635, Cl. 424-81.000.
Hase, Takashi; Yoshikawa, Masatake; and Takanashi, Haruyuki, to Dai Nippon Toryo Co., Ltd. Chlorosilicate phosphor. 4,128,498, Cl. 252-301.40F.
Hasebe, Isamu: *See*—
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Hashimoto, Tsutomu: *See*—
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Hassall, Cedric H.: *See*—
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Hasten, Jimmie L.: *See—*
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Hatch, Richard W. Automatic coupling mechanism for snow-plows and the like. 4,127,951, Cl. 37-44.000.
Hater, Martin; Pluschkell, Wolfgang; and Wisnewski, Heinrich, to Hoesch Werke Aktiengesellschaft. Method of introducing aluminum wire into steel melts and apparatus for practicing said method. 4,128,414, Cl. 75-58.000.
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J. Method of gaging and joining pipe. 4,127,927, Cl. 29-407.000.
Hauk, Thomas D.: *See—*
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., 4,127,927, Cl. 29-407.000.
Hausmann, Erich. Extended capacity cartridge magazine structure. 4,127,954, Cl. 42-50.000.
Haver & Boecker Drahtweberei und Maschinenfabrik: *See—*
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Hayakawa, Koji: *See—*
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Hayama, Noboru; and Tsuji, Yoshio, to Riso Kagaku Corporation. Stencil paper assembly. 4,128,057, Cl. 101-128.200.
Hayashi, Katsutake; Saitoh, Tutomu; Yomogida, Katsuyuki; and Saito, Hiromasa, to Shiseido Co., Ltd. Cosmetics and process for preparation thereof. 4,128,630, Cl. 424-69.000.
Hayashi, Makio; and Hisatomi, Takashi, to Nissan Motor Company, Limited. Throttle valve operating mechanism. 4,128,087, Cl. 123-103.00E.
Hayashi, Masaki; Kori, Seiji; and Miyake, Hajimu, to Ono Pharmaceutical Company. Prostaglandin analogues. 4,128,720, Cl. 560-9.000.
Hayashi, Yuji: *See—*
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Hayden, Daniel B.: *See—*
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Haytayan, Harry M., to Pneutek, Inc. Control valves. 4,128,110, Cl. 137-454.200.
Hazelett Strip-Casting Corporation: *See—*
Kemerer, William J.; and Vassar, Clyde W., 4,128,369, Cl. 425-113.000.
Headen, William E.; and Levesque, George N., to Brown & Sharpe Manufacturing Company. Linear motion ball bearing with dynamic stiffness. 4,128,278, Cl. 308-3.00A.
Heaps, John M.; and Lu, Chisen, to Formica International Limited. Thermoplastic polymer sheets or web material useful as surfacing materials and their manufacture. 4,128,689, Cl. 428-311.000.
Heaps, Joseph D.; and Tufte, Obert N., to Honeywell Inc. Silicon coated ceramic substrate with improvements for making electrical contact to the interface surface of the silicon. 4,128,680, Cl. 428-137.000.
Heck, Richard F., to University of Delaware. Process for the preparation of carboxylic acid amides from organic halides. 4,128,554, Cl. 546-317.000.
Heckle, William A.: *See—*
Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., 4,128,571, Cl. 260-465.900.
Hedler, Robert A., to GTE Sylvania Incorporated. Method of making pigmented phosphors. 4,128,674, Cl. 427-218.000.
Hegedus, Louis; and Summers, Jack C., to General Motors Corporation. Platinum-rhodium catalyst for automotive emission control. 4,128,506, Cl. 252-466.0PT.
Heinrich Baumgarten Eisen- und Blechwarenfabrik: *See—*
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Heinrich, Gert: *See—*
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Heise, Hartmut: *See—*
Kummerle, Kurt; Heise, Hartmut; and Hille, Ernst, 4,128,578, Cl. 260-562.00R.
Hellmann, James J. Manual trash compactor. 4,128,055, Cl. 100-245.000.
Helmut, Judat: *See—*
Buchner, Werner; Degen, Bruno; Fries, Ludwig; Helmut, Judat; Mundil, Rudolf; and Rudolph, Karl-Heinz, 4,128,568, Cl. 260-448.20E.
Hendricks, Udo W.; and Walz, Klaus, to Bayer Aktiengesellschaft. N(O,O dialkylphosphonyl alkylene) esters of oxazolidone, benzoxazolinone and dihydrooxazinone. 4,128,558, Cl. 260-307.00C.
Hendrickson, I. Glen: *See—*
Hansen, Karl A.; and Hendrickson, I. Glen, 4,127,933, Cl. 29-605.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,128,634, Cl. 424-81.000.
Hase, Brigitte; Hase, Christian; Galinke, Joachim; and Wegemund, Bernd, 4,128,635, Cl. 424-81.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,128,636, Cl. 424-81.000.
Henniger, Peter W.: *See—*
van der Drift, Johannes K.; Henniger, Peter W.; and van Veen, Gerard J., 4,128,547, Cl. 260-239.100.
Henville, Michael I., to Mars, Inc. Coin testing mechanisms. 4,128,157, Cl. 194-97.00R.
Herbst, Noel M.; and Liu, Chao N., to International Business Machines Corporation. Signature verification method and apparatus utilizing both acceleration and pressure characteristics. 4,128,829, Cl. 340-146.3SY.
Hercules Incorporated: *See—*
Reid, Albert R., 4,128,692, Cl. 428-378.000.
Richwine, John R., 4,128,510, Cl. 528-36.000.
Herman, Ronald E., to Colt Industries Operating Corp. Apparatus and system for controlling the air-fuel ratio supplied to a combustion carburetor. 4,128,088, Cl. 123-119.0EC.
Herrick, Joseph R.: *See—*
van Linden, Jan H. L.; Claxton, Raymond J.; Herrick, Joseph R.; and Ormesher, Robert J., 4,128,415, Cl. 75-65.00R.
Hertkorn, Douglas J., to Robert J. McNair, Jr. Target casting apparatus. 4,127,956, Cl. 43-19.000.
Herzog, Gordon W.; and Gaensbauer, Herbert A., to Canadian General Electric Company Limited. Control and protection of brushless synchronous motors. 4,128,792, Cl. 318-706.000.
Heyman, Albert M., to Honeywell Information Systems Inc. Power supply regulation using switching transistors. 4,128,867, Cl. 363-21.000.
Heymer, Gero: *See—*
Stenzel, Jurgen; and Heymer, Gero, 4,128,620, Cl. 423-299.000.
Hicks, Alan A.; Spinello, John O.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Chase-type board game apparatus. 4,128,246, Cl. 273-243.000.
Hiestand, Armin: *See—*
Nachbur, Hermann; Hiestand, Armin; and Rohringer, Peter, 4,128,687, Cl. 428-253.000.
Hildebolt, William M., to Campbell Soup Company. Protein texturization by extrusion with internal steam injection. 4,128,051, Cl. 99-348.000.
Hill, Edward J. Device for carrying hanging clothes. 4,128,196, Cl. 224-45.00T.
Hillard, Ray L.: *See—*
Grosso, Vincent G.; and Hillard, Ray L., 4,128,726, Cl. 560-72.000.
Hille, Ernst: *See—*
Kummerle, Kurt; Heise, Hartmut; and Hille, Ernst, 4,128,578, Cl. 260-562.00R.
Hindin, Saul G.: *See—*
Carr, William C.; Polinski, Leon M.; Hindin, Saul G.; and Kosco, James L., 4,128,591, Cl. 260-668.00A.
Hinz, Gerhardt J. Carrying apparatus detachably mountable on clothing and other fabric-like materials. 4,128,194, Cl. 224-5.00R.
Hinz, HansDieter: *See—*
Rothgordt, Ulf; Hinz, HansDieter; and Verspui, Gerrit, 4,128,842, Cl. 346-155.000.
Hioki, Issaku, to NTN Toyo Bearing Company Limited. Shim for cassette tapes and method of shaping the same. 4,128,216, Cl. 242-199.000.
Hirade, Kenkichi: *See—*
Samejima, Shuichi; and Hirade, Kenkichi, 4,128,828, Cl. 340-146.1AQ.
Hirano, Jiro: *See—*
Ishida, Shiro; Funatsuki, Genuemon; Izaiku, Hiromi; and Hirano, Jiro, 4,128,483, Cl. 252-8.600.
Hiratsuka, Nobuo; and Yaginuma, Nakatsugu, to Fuji Photo Film Co., Ltd. Supports for electrophoresis and process for the production of the same. 4,128,470, Cl. 204-299.00R.
Hirose, Shintaro: *See—*
Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, 4,128,138, Cl. 181-167.000.
Hisatomi, Takashi: *See—*
Hayashi, Makio; and Hisatomi, Takashi, 4,128,087, Cl. 123-103.00E.
Hitachi Chemical Company, Ltd.: *See—*
Toyoda, Shinichi; Sakai, Masahiko; Goto, Kazuo; Narahara, Toshikazu; and Karasawa, Yoshiharu, 4,128,531, Cl. 528-53.000.
Hitachi, Ltd.: *See—*
Kinjo, Noriyuki; Nishikawa, Akio; Katagiri, Junichi; Yokono, Hitoshi; Ikeda, Tamotsu; and Kobayashi, Tsuguo, 4,128,527, Cl. 260-42.180.
Kotera, Nobuo; and Miyamoto, Nobuo, 4,128,681, Cl. 428-138.000.
Nagao, Masato; and Kusumoto, Sho, 4,128,762, Cl. 250-272.000.
Nakagawa, Isao, 4,128,848, Cl. 358-167.000.
Otsu, Shinpei; Sekiguchi, Akira; Tobita, Nobuyoshi; Chikamatsu, Shigeru; Hosoe, Yoshihisa; Matsui, Motoaki; Sugimoto, Noboru; and Totsuka, Noriyoshi, 4,128,378, Cl. 425-445.000.
Sonobe, Tadasi, 4,128,780, Cl. 310-265.000.
Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,128,187, Cl. 220-464.000.
HOBEG Hochtemperaturreaktor-Brennelement G.m.b.H: *See—*
Huschka, Hans; and Warzawa, Wolfgang, 4,128,075, Cl. 118-49.100.
Hoch, Manfried L., to International Harvester Company. Hay conditioning roll. 4,127,979, Cl. 56-1.000.

Hochstein, Spence L.: *See*—
Kaigler, Noyle B., Jr., deceased; Kaigler, Mary A., executrix; Hochstein, Spence L.; and Maple, James A., 4,128,219, Cl. 248-55.000.
Hoebrechts, Albert G.: *See*—
van den Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 4,127,916, Cl. 15-250.420.
Hoechst Aktiengesellschaft: *See*—
Berthold, Rudiger, 4,128,579, Cl. 260-566.00A.
Kummerle, Kurt; Heise, Hartmut; and Hille, Ernst, 4,128,578, Cl. 260-562.00R.
Leupold, Ernst I.; and Arpe, Hans-Jurgen, 4,128,575, Cl. 562-579.000.
Leupold, Ernst I.; Arpe, Hans-Jurgen; Renken, Albert; and Schlosser, Ernst-Gunther, 4,128,727, Cl. 560-247.000.
Merkel, Wulf; Alpermann, Hans G.; Geisen, Karl; Kothe, Norbert; and Ried, Walter, 4,128,643, Cl. 424-251.000.
Stenzel, Jurgen; and Heymer, Gero, 4,128,620, Cl. 423-299.000.
Hoehn, Hans; Bernstein, Jack; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Derivatives of 5,6-dihydrobenzo[5,6]cyclohepta[1,2-B]pyrazolo-[4,3-E]pyridin-11 (1H)-ones and 11 (1H)-imines. 4,128,717, Cl. 544-361.000.
Hoehn, Hans: *See*—
Denzel, Theodor; and Hoehn, Hans, 4,128,645, Cl. 424-251.000.
Hoelzinger, Walther J., to Boise Cascade Corporation. Multi-flute-layer corrugated board. 4,128,677, Cl. 428-57.000.
Hoesch Werke Aktiengesellschaft: *See*—
Hater, Martin; Pluschkell, Wolfgang; and Wisnewski, Heinrich, 4,128,414, Cl. 75-58.000.
Hoffmann-La Roche Inc.: *See*—
Atherton, Frank R.; Hall, Michael J.; Hassall, Cedric H.; Lambert, Robert W.; and Ringrose, Peter S., 4,128,542, Cl. 260-112.50R.
Mlodozeniec, Arthur R., 4,128,444, Cl. 156-64.000.
Sturzenegger, August; Mlodozeniec, Arthur R.; and Lipinsky, Edward S., 4,128,445, Cl. 156-64.000.
Hogenhout, Franciscus; and McDermott, Arthur W., to Boeing Company, The. Electromagnetic high energy impact apparatus. 4,128,000, Cl. 72-430.000.
Hogshead, Rodney C., III. Shipping and display carton for plants and the like. 4,128,167, Cl. 206-44.00R.
Hollandse Signaalapparaten B.V.: *See*—
Brands, Antoon H.; and Gietema, Jouke, 4,128,838, Cl. 343-55.00C.
Hollick, John G., to USM Corporation. Process for stiffening flexible sheet material. 4,127,910, Cl. 12-146.00D.
Holset Engineering Company Limited: *See*—
Main, Peter L., 4,128,153, Cl. 192-58.00B.
Palmer, Clifford A., 4,128,283, Cl. 308-237.00R.
Holtz, Hans D.: *See*—
Smith, Clifford E.; and Holtz, Hans D., 4,128,596, Cl. 260-683.530.
Homburg, Axel: *See*—
Gawlick, Heinz; and Homburg, Axel, 4,128,060, Cl. 102-92.700.
Homeier, Edwin H., to UOP Inc. Production of ammonia. 4,128,621, Cl. 423-362.000.
Homsy, Charles A. Structure suitable for in vivo implantation. 4,127,902, Cl. 3-1.000.
Honeywell Inc.: *See*—
Aske, Vernon H., 4,128,010, Cl. 73-497.000.
Chiang, Alice M., 4,128,843, Cl. 357-30.000.
Heaps, Joseph D.; and Tufte, Obert N., 4,128,680, Cl. 428-137.000.
Ruminsky, Robert T., 4,128,854, Cl. 361-22.000.
Wong, Theodore T. S., 4,128,338, Cl. 356-432.000.
Honeywell Information Systems Inc.: *See*—
Heyman, Albert M., 4,128,867, Cl. 363-21.000.
Honnen, Lewis R., to Chevron Research Company. Fuel additive for distillate fuels. 4,128,403, Cl. 44-71.000.
Hoover, Richard L. Means and graphical method of calculating moments of inertia. 4,127,941, Cl. 33-1.00C.
Hora, Charles J.: *See*—
Sieglaff, Charles L.; Hora, Charles J.; and Tiefenbach, Joseph P., 4,128,318, Cl. 351-160.00R.
Horie, Koshi: *See*—
Yamauchi, Shin; Yonehara, Kiyoshi; Horie, Koshi; Ono, Tetsuji; and Ohara, Takashi, 4,128,503, Cl. 252-435.000.
Horine, James: *See*—
Gay, Danny; Horine, James; Hudson, James C.; Sallee, Joseph P.; and Wininger, Hershel R., 4,128,029, Cl. 83-437.000.
Horn, Peter; Koehler, Waldemar; and Bittler, Rolf, to BASF Aktiengesellschaft. Continuous manufacture of organic isocyanates. 4,128,569, Cl. 260-453.0PH.
Hoshi, Kinji; and Sugita, Kazuhiro, to Sony Corporation. Method of making a semiconductor wafer. 4,127,969, Cl. 51-283.00R.
Hoshidenki-Seizo Kabushiki Kaisha: *See*—
Ojima, Shin; Ohgami, Kazuhiko; Watanabe, Kazutaka; Nohara, Masaru; and Yamamoto, Kenji, 4,128,889, Cl. 364-705.000.
Hosoe, Yoshihisa: *See*—
Otsu, Shinpei; Sekiguchi, Akira; Tobita, Nobuyoshi; Chikamatsu, Shigeru; Hosoe, Yoshihisa; Matsui, Motoaki; Sugimoto, Noboru; and Totsuka, Noriyoshi, 4,128,378, Cl. 425-445.000.
Houbion, John A., to Monsanto Company. o-Aroylvinyl benzoyl chlorides. 4,128,576, Cl. 260-544.00D.
Hsu, John S., to Ingersoll-Rand Co. Extruder screw. 4,128,341, Cl. 366-89.000.
Hubbard, Harold C., to Motor Wheel Corporation. Remote control circuit for electric trailer brakes. 4,128,146, Cl. 188-138.000.
Hudson, James C.: *See*—
Gay, Danny; Horine, James; Hudson, James C.; Sallee, Joseph P.; and Wininger, Hershel R., 4,128,029, Cl. 83-437.000.
Huellwegen, Josef, to Nixdorf Computer AG. Circuit arrangement for blocking a bidirectional amplifier against receiving outgoing signals. 4,128,743, Cl. 179-170.00R.
Hug, Hans A., to United States of America, Interior. Torquer/thruster for flexible roofdrill. 4,128,133, Cl. 173-149.000.
Hughes Aircraft Company: *See*—
Fraas, Lewis M.; Zanio, Kenneth R.; and Knechtli, Ronald C., 4,128,733, Cl. 136-89.0SJ.
Lim, Hong S.; and Little, Michael J., 4,128,312, Cl. 350-336.000.
Pastor, Ricardo C.; and Robinson, Morton, 4,128,589, Cl. 260-653.000.
Troutman, Bruce L.; and Schmitz, Lawrence S., 4,128,773, Cl. 307-238.000.
Hujer, Friedrich: *See*—
Fergg, Berthold; Hujer, Friedrich; and Zahn, Wolfgang, 4,128,330, Cl. 355-32.000.
Humber, Leslie G.: *See*—
Asselin, Andre A.; Humber, Leslie G.; and Dobson, Thomas A., 4,128,560, Cl. 260-315.000.
Humphreys, Hutcheson & Moseley: *See*—
Sneed, Jackson B., 4,128,393, Cl. 431-351.000.
Hunsucker, Jerry H.; and Selleck, James R., Jr., to International Minerals & Chemical Corp. Imidazoline compounds useful as bactericides and fungicides. 4,128,655, Cl. 424-273.00R.
Hunt, Barry R.; Dillard, George M.; and Taylor, Henry F., to United States of America, Navy. Fiber optic delay line filter. 4,128,759, Cl. 250-199.000.
Hunt, John D.; and Peacock, Frederick C., to Imperial Chemical Industries Limited. Substituted dinitrotrifluoromethyldiphenylamine and pesticidal compositions containing same. 4,128,665, Cl. 424-330.000.
Huron Tool & Manufacturing Division of U.S. Industries, Inc.: *See*—
Oldford, William G., 4,128,264, Cl. 285-41.000.
Huschka, Hans; and Warzawa, Wolfgang, to HOBEG Hochtemperaturreaktor-Brennelement G.m.b.H. Apparatus for coating fuel fertile or absorber material containing particles for high temperature fuel elements. 4,128,075, Cl. 118-49.100.
Husson, Alan L.: *See*—
Caputo, William R.; and Husson, Alan L., 4,128,141, Cl. 187-29.00R.
Hwang, Yu-Tang; and Grimmett, Howard L. Polymerization catalyst and method. 4,128,500, Cl. 252-430.000.
Hyams, Irving; Koch, Harold S.; and Aafjes, Herman C., to Fischer & Porter Co. Fuse-mate. 4,128,024, Cl. 81-3.800.
Hydra-Rig, Inc.: *See*—
Elliston, Thomas L., 4,128,229, Cl. 254-139.000.
Hydrocarbon Research, Inc.: *See*—
Chervenak, Michael C.; and Wolk, Ronald H., 4,128,109, Cl. 137-375.000.
Hydrotechnic Corporation: *See*—
Nebolsine, Rostislav, 4,128,477, Cl. 210-50.000.
HZI Research Center Inc.: *See*—
Itil, Turan M., 4,128,641, Cl. 424-250.000.
ICI Australia Limited: *See*—
Moody, Keith, 4,128,638, Cl. 424-177.000.
Ideal Industries, Inc.: *See*—
McCord, Daniel, 4,128,294, Cl. 339-266.00R.
Idota, Yoshio, to Fuji Photo Film Co., Ltd. Process for regenerating bleaching-fixing solution. 4,128,464, Cl. 204-151.000.
Ikeda, Tamotsu: *See*—
Kinjo, Noriyuki; Nishikawa, Akio; Katagiri, Junichi; Yokono, Hitoshi; Ikeda, Tamotsu; and Kobayashi, Tsuguo, 4,128,527, Cl. 260-42.180.
Ikenoue, Shinpei; Masuda, Takao; Suzuki, Nobuo; Tanaka, Toshiharu; and Sashihara, Kenji, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,128,428, Cl. 96-114.100.
Illenberger, Arno; Ruprecht, Gert; and Berger, Klaus, to Robert Bosch GmbH. Camera tube target structure exhibiting greater-than-unity amplification. 4,128,844, Cl. 357-31.000.
Illinois Tool Works Inc.: *See*—
Kobetsky, Robert G., 4,128,449, Cl. 156-380.000.
Rayburn, Charles C., 4,128,857, Cl. 361-309.000.
Imperial Chemical Industries Limited: *See*—
Cleare, Peter J. V., 4,128,585, Cl. 260-601.00H.
Hadfield, Harry R.; Sumner, Harry H.; and Williams, Gerald, 4,128,395, Cl. 8-2.50A.
Hunt, John D.; and Peacock, Frederick C., 4,128,665, Cl. 424-330.000.
Imperial Oil Limited: *See*—
Cohen, A. David, 4,128,499, Cl. 252-378.00R.
Ing. C. Olivetti & C., S.p.A.: *See*—
Claudio, Gillio, 4,128,382, Cl. 400-478.000.
Ingersoll-Rand Co.: *See*—
Hsu, John S., 4,128,341, Cl. 366-89.000.
Schleinkofer, Rudi W., 4,128,454, Cl. 162-49.000.
Inland Steel Company: *See*—
Lee, Harvie H., 4,128,676, Cl. 427-433.000.
Innovation and Technical Development Co.: *See*—
Townsend, David J., 4,127,921, Cl. 24-27.000.
Inolex Corporation: *See*—
Johnsen, Vernon L.; and Stern, Elaine S., 4,128,543, Cl. 260-123.700.

Inter-Elec: *See—*
Lejeune, Gerard; and Dubreucq, Jean-Claude, 4,128,806, Cl. 324-54.000.

Inter Innovation AB: *See—*
Lundblad, Leif, 4,128,236, Cl. 271-10.000.

Interlemo Holding, S.A. c/o Curia Treuchand A.G.: *See—*
Mouttet, Leon, 4,128,292, Cl. 339-176.00R.

International Business Machines Corporation: *See—*
Almasi, George S.; Keefe, George E.; and Lin, Yeong S., 4,128,895, Cl. 365-11.000.
Ames, Richard N.; Hardin, Dick K.; Leininger, Joel C.; and Taylor, George P., 4,128,876, Cl. 364-200.000.
Gaensslen, Fritz H., 4,128,670, Cl. 427-86.000.
Herbst, Noel M.; and Liu, Chao N., 4,128,829, Cl. 340-146.3SY.
Jambotkar, Chakrapani G., 4,128,439, Cl. 148-1.500.
Lin, Yeong S.; Liu, Chao N.; and Tang, Donald T., 4,128,891, Cl. 364-900.000.
Weythman, Gayle A., 4,128,830, Cl. 340-146.3AG.

International Flavors & Fragrances Inc.: *See—*
Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., 4,128,729, Cl. 568-820.000.

International Harvester Company: *See—*
Frase, Roland J.; Meitl, Harold G.; and McNaull, Tom M., 4,128,191, Cl. 222-167.000.
Hoch, Manfried L., 4,127,979, Cl. 56-1.000.

International Minerals & Chemical Corp.: *See—*
Hunsucker, Jerry H.; and Selleck, James R., Jr., 4,128,655, Cl. 424-273.00R.
Ivy, Richard E.; and Williams, Robert D., 4,128,642, Cl. 424-251.000.
Traxler, James T.; Lira, Emil P.; and Kraemer, John F., 4,128,263, Cl. 282-27.500.

International Octrooimaatschappij "Octropa" BV: *See—*
Munden, David R., 4,128,508, Cl. 252-522.000.

International Telephone and Telegraph Corporation: *See—*
Dhami, Kewal S.; Bennett, Elmer W.; and Burton, Pearl, 4,128,693, Cl. 428-379.000.

Interox Chemicals Limited: *See—*
McCrudden, Joseph E., 4,128,495, Cl. 252-186.000.

InterRoyal Corporation: *See—*
Frey, Frederick J., 4,128,120, Cl. 160-191.000.

Irvin Industries, Inc.: *See—*
Gay, Danny; Horine, James; Hudson, James C.; Sallee, Joseph P.; and Wininger, Hershel R., 4,128,029, Cl. 83-437.000.

Irwin, John M.; and Schlereth, Fritz H., to General Electric Company. Integrated arithmetic unit and digital networks using the unit. 4,128,890, Cl. 364-724.000.

Ischenko, Vitaly G.; Shvetsov, Vladimir A.; Erygin, Evgeny N.; and Girshik, Roman L. Device for removing flash from moulded rubber articles. 4,128,197, Cl. 225-97.000.

Ishida, Shiro; Funatsuki, Genuemon; Izaiku, Hiromi; and Hirano, Jiro, to Nippon Oil and Fats Co. Ltd. Sulfur-containing complex esters and spin finishing compositions using said esters. 4,128,483, Cl. 252-8.600.

Ishida, Takahiro: *See—*
Yamada, Koichi; Harato, Takuo; Ishida, Takahiro; and Shiozaki, Yasumi, 4,128,618, Cl. 423-119.000.

Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Elctric Co., Ltd. Diaphragm for speaker. 4,128,138, Cl. 181-167.000.

Ishizuka, Hiroshi. Process for synthesizing diamonds. 4,128,625, Cl. 423-446.000.

Isogawa, Takao: *See—*
Yamamoto, Mitsuru; Arai, Jun; Isogawa, Takao; and Hasebe, Isamu, 4,128,881, Cl. 364-200.000.

Israel, George H., Jr.: *See—*
Ryan, Edward W.; and Israel, George H., Jr., 4,128,208, Cl. 239-265.390.

Itil, Turan M., to HZI Research Center Inc. Tetracyclic psychotropic drug. 4,128,641, Cl. 424-250.000.

Ivy, Richard E.; and Williams, Robert D., to International Minerals & Chemical Corp. Method of promoting growth and improving feed efficiency of animals. 4,128,642, Cl. 424-251.000.

Izaiku, Hiromi: *See—*
Ishida, Shiro; Funatsuki, Genuemon; Izaiku, Hiromi; and Hirano, Jiro, 4,128,483, Cl. 252-8.600.

Jablonski, Charles E.; and Kreiger, John W., to Atlas Powder Company. Method and apparatus for making dual compartment containers. 4,127,976, Cl. 53-450.000.

Jackson, Denis H. Indirectly fired vertical shaft furnace. 4,128,231, Cl. 266-154.000.

Jamann, Helmut, to Dr. Boy KG. Fluid pressure actuated drive for the closing unit of an injection moulding machine. 4,128,380, Cl. 425-450.100.

Jambotkar, Chakrapani G., to International Business Machines Corporation. Method for forming self-aligned field effect device by ion implantation and outdiffusion. 4,128,439, Cl. 148-1.500.

James, Claude: *See—*
Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,128,650, Cl. 424-258.000.

Japan Foundation For Artificial Organs: *See—*
Malchesky, Paul S.; and Nose, Yukihiko, 4,128,479, Cl. 210-321.00B.

Jencks, Charles L.: *See—*
Castonguay, Roger N.; Jencks, Charles L.; and Turton, Robert C., 4,128,750, Cl. 200-308.000.

Jevne, Allan: *See—*
Skinner, Earl; Emeott, Marvin; and Jevne, Allan, 4,128,600, Cl. 260-859.00R.

Joh. A. Benckiser GmbH: *See—*
Krueger, Friedrich; and Palleduhn, Dieter, 4,128,492, Cl. 252-180.000.

Johansson, Lars-Ake: *See—*
Borjesson, Leif R.; and Johansson, Lars-Ake, 4,128,125, Cl. 165-163.000.

Johns-Manville Corporation: *See—*
Pusch, Walter G., 4,128,434, Cl. 106-120.000.

Johnsen, Vernon L.; and Stern, Elaine S., to Inolex Corporation. Process for preparing alcohol soluble condensates of abietic acid and a protein hydrolysate. 4,128,543, Cl. 260-123.700.

Johnson, Edwin: *See—*
Kelly, James F.; and Johnson, Edwin, 4,128,065, Cl. 110-211.000.

Johnson, Eugene C.; and Dalessio, Frederick F., to Johnson, Eugene C. Method of and device for analyzing performances in athletic events. 4,128,893, Cl. 364-900.000.

Johnson, Herbert E.; and Richards, William W. Apparatus for separating adhesively connected material. 4,128,452, Cl. 156-584.000.

Johnson, Herbert L.: *See—*
Pacht, Amos; and Johnson, Herbert L., 4,128,207, Cl. 239-186.000.

Johnson, John L., to Scovill Manufacturing Company. Air gun. 4,128,209, Cl. 239-583.000.

Johnson, Kenneth L., to Betts Machine Company. Shock suppressing retainer ring and grommet for sealed beam lamps. 4,128,865, Cl. 362-369.000.

Johnson, Paul R.: *See—*
Shadid, Fahim E.; and Johnson, Paul R., 4,128,070, Cl. 114-74.00A.

Johnson, Robert. Extensible utility wagon. 4,128,258, Cl. 280-656.000.

Johnson, Robert H.: *See—*
Yamazaki, Yasuhiro; Johnson, Robert H.; and McNeil, Mark D., 4,128,339, Cl. 356-434.000.

Joly, Pierre: *See—*
Habermann, Helmut; Brunet, Maurice; and Joly, Pierre, 4,128,795, Cl. 318-618.000.

Jomon, Kazuyoshi: *See—*
Kurita, Masaru; Jomon, Kazuyoshi; Komori, Tadaaki; Nakatani, Isami; and Tsuji, Masahiro, 4,128,546, Cl. 260-239.00A.

Jones, Jean E.: *See—*
Fletcher, George L.; Wadsworth, Donald H.; and Jones, Jean E., 4,128,422, Cl. 96-48.0HD.

Jones, Richard H., to Standard Oil Company, The. Alkylation process utilizing hydrocarbon phase for cooling and compressed vapor for supplying heat to distillation column. 4,128,597, Cl. 260-683.620.

Jones, Robert W.; and Jones, Wesley E., to Jones, Wesley E. Livestock guide and manipulator. 4,128,200, Cl. 231-2.00E.

Jones, W. Dale. Rockable against-the-wall type reclining chair. 4,128,273, Cl. 297-327.000.

Jones, Wesley E.: *See—*
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Jost, Max: *See—*
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Joyce, Michael F., to Gillette Company, The. Holder for shaving units. 4,128,172, Cl. 206-352.000.

Jubin, John C., to Atlantic Richfield Company. Manufacture of tertiary butyl hydroperoxide. 4,128,587, Cl. 568-571.000.

Judkins, Thomas. Concealed fasteners for wall panels. 4,127,975, Cl. 52-489.000.

Junker, Arnold E. Water closet seat and bidet assembly. 4,127,904, Cl. 4-7.000.

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Liakumovich, Alexandr G.; Pantukh, Boris I.; Sultanova, Mengzda K.; Popov, Vasily P.; Tolstikov, Genrikh A.; Monakov, Jury B.; Juriev, Valery P.; Mandelshtam, Elena Y.; Korotkevich, Boris S.; and Shmuk, Jury A., 4,128,708, Cl. 526-162.000.

Justus, Edgar J., to Beloit Corporation. Headbox trailing element mounting and method. 4,128,455, Cl. 162-216.000.

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Kabushiki Kaisha Daini Seikosha: *See—*
Shimotsuma, Nobuo, 4,128,816, Cl. 331-116.00R.

Kabushiki Kaisha Hoya Lens: *See—*
Onoki, Fumio; and Kamiya, Hajime, 4,128,303, Cl. 350-164.000.

Kabushiki Kaisha Ohara Kogaku Garasu Seizosho: *See—*
Komorita, Fujio; and Nakahara, Muneo, 4,128,432, Cl. 106-53.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Takei, Yoshihiro, 4,128,798, Cl. 320-23.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Fujikake, Kenji; Katagiri, Haruo; and Yamada, Katsuhito, 4,128,363, Cl. 416-236.00A.

Kachadorian, James. Solar-heated concrete slab building structure. 4,127,973, Cl. 52-169.110.

Kaeding, Warren W., to Mobil Oil Corporation. Selective production of para dialkyl benzene. 4,128,592, Cl. 260-671.00C.

Kaeser, James A.: *See—*
Bauman, Robert A.; and Kaeser, James A., 4,128,485, Cl. 252-8.800.

Kage, Kouzou, to Nippon Electric Co., Ltd. Time diversity receiver for processing repeatedly received signal bits in consideration of a maximum-level and/or a favorably received signal bit. 4,128,809, Cl. 325-324.000.

Kaigler, Mary A., executrix: *See—*
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Kaigler, Noyle B., Jr., deceased; by Kaigler, Mary A., executrix; Hochstein, Spence L.; and Maple, James A., to Exxon Production Research Company. Aboveground sliding support assembly for a pipeline. 4,128,219, Cl. 248-55.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Gane, Gordon R., 4,128,186, Cl. 220-268.000.
Kaiser, Hans, to Gebruder Junghans GmbH. Safety system for a projectile fuse. 4,128,061, Cl. 102-249.000.
Kalapos, Josef: *See*—
Mueller, Roman; and Kalapos, Josef, 4,128,052, Cl. 99-516.000.
Kaminski, Gerald W.: *See*—
Samuel, Robert A.; Kaminski, Gerald W.; and Layne, Michael W., 4,127,939, Cl. 32-11.000.
Kamiya, Hajime: *See*—
Onoki, Fumio; and Kamiya, Hajime, 4,128,303, Cl. 350-164.000.
Kamm, Eugen: *See*—
Gaiser, Dieter; Woellhaf, Josef; Schoettle, Klaus; Guenther, Friedrich; Kamm, Eugen; and Wendt, Erich, 4,127,925, Cl. 29-430.000.
Kanbe, Masaru: *See*—
Ohta, Hideyasu; Uozumi, Takahiro; Kanbe, Masaru; Abe, Naoto; Shirasaki, Jun; and Mayama, Masayoshi, 4,128,426, Cl. 96-87.00R.
Kankaanpaa, Matti, to Valmet Oy. Supercalenders. 4,128,053, Cl. 100-162.00R.
Kaplit, Michael: *See*—
Smith, George W.; Kaplit, Michael; and Hayden, Daniel B., 4,128,311, Cl. 350-331.000.
Kaplow, Roy; and Frank, Robert I., to Massachusetts Institute of Technology. Solar cell. 4,128,732, Cl. 136-89.0PC.
Karasawa, Yoshiharu: *See*—
Toyoda, Shinichi; Sakai, Masahiko; Goto, Kazuo; Narahara, Toshikazu; and Karasawa, Yoshiharu, 4,128,531, Cl. 528-53.000.
Karpaty, Akos: *See*—
Muhlbock, Franz; Karpaty, Akos; and Pross, Wilhelm, 4,128,400, Cl. 422-101.000.
Karpen, William L., to Carpenter Technology Corporation. Stabilization of sodium/potassium silicate-containing coating bath. 4,128,487, Cl. 252-28.000.
Karr, Clarence, Jr.; and McCaskill, Kenneth B., to United States of America, Energy. Catalytic hydrotreating process. 4,128,473, Cl. 208-108.000.
Kassai, Makoto: *See*—
Tanaka, Akira; Hayashi, Yuji; Kassai, Makoto; and Hara, Toshito, 4,128,823, Cl. 335-196.000.
Katagi, Kazuo, to RCA Corporation. Range mark generation. 4,128,834, Cl. 343-5.0EM.
Katagiri, Haruo: *See*—
Fujikake, Kenji; Katagiri, Haruo; and Yamada, Katsuhito, 4,128,363, Cl. 416-236.00A.
Katagiri, Junichi: *See*—
Kinjo, Noriyuki; Nishikawa, Akio; Katagiri, Junichi; Yokono, Hitoshi; Ikeda, Tamotsu; and Kobayashi, Tsuguo, 4,128,527, Cl. 260-42.180.
Katchman, Arthur; and Lee, Gim F., Jr., to General Electric Company. Polyphenylene ether compositions containing rubber modified polystyrene. 4,128,602, Cl. 260-876.00R.
Katchman, Arthur; and Lee, Gim F., Jr., to General Electric Company. Compositions comprising polyphenylene ether and rubber modified polystyrene. 4,128,603, Cl. 260-876.00R.
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Kato, Akifumi: *See*—
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Kato, Kazuo; and Narihiro, Michiaki, to New Nippon Electric Company, Ltd. Turret type television tuner. 4,128,821, Cl. 334-51.000.
Kato, Yoshio: *See*—
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,128,706, Cl. 526-19.000.
Katz, Jonathon H. Phase shift circuit for synchronous motor. 4,128,791, Cl. 318-724.000.
Katz, Myron B. Method of obtaining a uniquely determined cross-sectional reconstruction from X-ray projections. 4,128,877, Cl. 364-414.000.
Katz, Solly. Solar heaters. 4,128,096, Cl. 126-271.000.
Kawaguchi, Hitoshi; and Furukawa, Yoshitaka, to Nippon Telegraph and Telephone Public Corp. Single transverse mode operation in double heterostructure junction laser. 4,128,815, Cl. 331-94.50H.
Kawano, Haruyoshi, to Ricoh Company, Ltd. Apparatus for producing bias voltage for use in electrophotographic copying machines. 4,128,329, Cl. 355-14.000.
Kawasaki, Ryoichi: *See*—
Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, 4,128,138, Cl. 181-167.000.
Keefe, George E.: *See*—
Almasi, George S.; Keefe, George E.; and Lin, Yeong S., 4,128,895, Cl. 365-11.000.
Keep View Ltd.: *See*—
Colwell, David J., 4,127,908, Cl. 5-370.000.
Kellmann, Werner: *See*—
Braun, Rudolf; and Kellmann, Werner, 4,128,115, Cl. 139-439.000.
Kelly, James F.; and Johnson, Edwin, to Materials Recovery Corporation. General purpose incinerator/combustor. 4,128,065, Cl. 110-211.000.
Kelly, William J.: *See*—
Bond, Thomas J.; Kelly, William J.; and Adams, Richard C., 4,128,383, Cl. 425-529.000.
Kemerer, William J.; and Vassar, Clyde W., to Hazelett Strip-Casting Corporation. Continuous apparatus for forming products from thermoplastic polymeric material having three-dimensional patterns and surface textures. 4,128,369, Cl. 425-113.000.
Kemmner, Ulrich; and Ruhl, Karl, to Robert Bosch GmbH. Fuel supply unit. 4,128,365, Cl. 417-423.00R.
Kempler, Fred. Optical magnifying device. 4,128,306, Cl. 350-239.000.
Kennecott Copper Corporation: *See*—
Rappas, Alkis S.; and Pemsler, J. Paul, 4,128,416, Cl. 75-119.000.
Kernforschungsanlage Julich Gesellschaft m.beschrankter Haftung: *See*—
Forster, Siegfried; and Kleemann, Manfred, 4,128,126, Cl. 165-165.000.
Keslar, Leroy D.: *See*—
Bitterice, Michael G.; and Keslar, Leroy D., 4,128,448, Cl. 156-166.000.
Kidde Consumer Durables Corp.: *See*—
Evans, Mark, 4,128,171, Cl. 206-320.000.
Kienzle Apparate GmbH: *See*—
Fairley, John; Krickl, Josef; and Weber, Robert, 4,128,755, Cl. 235-92.00T.
Kikuchi, Katsuro; Masai, Shohachi; and Tanaka, Tsugane, to Asahi-Dow Limited; and Koyo Sangyo Co., Ltd. Coated styrenic resin plate for ink-acceptability and paintability. 4,128,695, Cl. 428-423.000.
Kildahl, Nicholas K.; and Fotis, Peter, to Standard Oil Company (Indiana). Ethylene polymerization catalyst. 4,128,502, Cl. 252-431.00R.
Kilvington, Howard J.: *See*—
O'Hara, Kevin J.; and Kilvington, Howard J., 4,128,436, Cl. 106-243.000.
Kimura, Takeji: *See*—
Wada, Ryoichi; Fujisaki, atsumi; Nakajima, Masaya; Tsunoo, Masahiko; and Kimura, Takeji, 4,128,032, Cl. 84-1.010.
Kinder, Mark R., to TRW Inc. Coupling apparatus. 4,128,023, Cl. 74-750.00R.
King, Peter G., to Mackenzie King Holdings Limited; and Formica Limited. Construction of articles of furniture. 4,128,284, Cl. 312-330.00R.
Kinjo, Noriyuki; Nishikawa, Akio; Katagiri, Junichi; Yokono, Hitoshi; Ikeda, Tamotsu; and Kobayashi, Tsuguo, to Hitachi, Ltd. Dynamo-electric machine having coil windings and core encapsulated with resin-filler composition. 4,128,527, Cl. 260-42.180.
Kinoko Company, The: *See*—
Mee, Henry M., 4,127,964, Cl. 47-1.100.
Mee, Henry M., 4,127,965, Cl. 47-1.100.
Kinoshita, Youzou: *See*—
Shiomura, Tetsunosuke; Kinoshita, Youzou; and Kokue, Yoshio, 4,128,607, Cl. 260-878.00B.
Kirchner, Eugene M.: *See*—
Oren, Jess W., III; Kirchner, Eugene M.; and Wehry, Charles F., Jr., 4,128,095, Cl. 126-270.000.
Kishida, Kazuo; Kobayashi, Jinpee; and Fukunaga, Hajime, to Mitsubishi Rayon Co., Ltd. Process for preparing vinyl chloride resin-acrylic graft copolymer composition. 4,128,605, Cl. 260-876.00R.
Kitaguchi, Sam S.: *See*—
Bons, Robert; and Kitaguchi, Sam S., 4,128,769, Cl. 290-52.000.
Kitamoto, Tatsuji: *See*—
Shirahata, Ryuji; Kitamoto, Tatsuji; and Suzuki, Masaaki, 4,128,691, Cl. 428-336.000.
Kleemann, Manfred: *See*—
Forster, Siegfried; and Kleemann, Manfred, 4,128,126, Cl. 165-165.000.
Klein, Andrew: *See*—
Barabas, Eugene S.; Klein, Andrew; and Alwani, Dru W., 4,128,520, Cl. 260-29.70W.
Klein, Samuel. Feed for poultry. 4,128,640, Cl. 424-195.000.
Klinkenberg, Herbert: *See*—
Vollkommer, Norbert; Petersen, Egon N.; Klinkenberg, Herbert; and Schmidt, Werner, 4,128,709, Cl. 526-218.000.
Klopfer, Howard J.; and Campbell, John R., to General Electric Company. Preparation of 1,1,1-trichloro-2,2-bis(4-hydroxyphenyl)ethane. 4,128,731, Cl. 568-726.000.
Kluepfel, Olaf: *See*—
Uthoff, Werner; and Kluepfel, Olaf, 4,128,116, Cl. 141-1.000.
Kluting, Bernd; and Voss, Hans W., to Fritz Keiper KG, Firma. Constant torque adjustable seat. 4,128,225, Cl. 248-421.000.
Knechtli, Ronald C.: *See*—
Fraas, Lewis M.; Zanio, Kenneth R.; and Knechtli, Ronald C., 4,128,733, Cl. 136-89.0SJ.
Knibbe, Jan C.; and McPhee, Willard J., to Springfield Tool & Die, Inc. Piercing apparatus. 4,128,028, Cl. 83-411.00R.
Knight, Phillip D.; deMauriac, Richard A.; and Graham, Patricia A., to Eastman Kodak Company. Silver salts of 1,2,4-mercaptotriazole derivatives. 4,128,557, Cl. 260-299.000.
Knight, Robert K., to Union Oil Company of California. Mobility control of aqueous fluids in porous media. 4,128,482, Cl. 252-8.55D.
Knobloch, Johannes F.; and Brunner, Ernst, to H.A. Schlatter AG. High current-rectifier arrangement. 4,128,870, Cl. 363-141.000.
Knowles, Reginald. Differential mechanism. 4,128,021, Cl. 74-650.000.
Kobayashi, Hideo: *See*—
Yokota, Masato; and Kobayashi, Hideo, 4,128,092, Cl. 123-191.00S.
Kobayashi, Jinpee: *See*—
Kishida, Kazuo; Kobayashi, Jinpee; and Fukunaga, Hajime, 4,128,605, Cl. 260-876.00R.

Kobayashi, Nariyoshi: *See*—
Nishimura, Hideo; Masaki, Seishi; Miyauchi, Takao; and Kobayashi, Nariyoshi, 4,128,460, Cl. 204-35.00N.
Kobayashi, Tsuguo: *See*—
Kinjo, Noriyuki; Nishikawa, Akio; Katagiri, Junichi; Yokono, Hitoshi; Ikeda, Tamotsu; and Kobayashi, Tsuguo, 4,128,527, Cl. 260-42.180.
Kobayashi, Tsutomu: *See*—
George, Peter K.; Gergis, Isoris S.; and Kobayashi, Tsutomu, 4,128,896, Cl. 365-12.000.
Kobetsky, Robert G., to Illinois Tool Works Inc. Induction heating fixture for applying adhesive-backed articles. 4,128,449, Cl. 156-380.000.
Kobori, Toshio; and Uchida, Isamu, to Minolta Camera Kabushiki Kaisha. Pentagonal prism and related optical structures for single lens reflex cameras. 4,128,321, Cl. 354-23.00R.
Koch, Harold S.: *See*—
Hyams, Irving; Koch, Harold S.; and Aafjes, Herman C., 4,128,024, Cl. 81-3.800.
Koeck, Donna M.: *See*—
Lowrey, Robert D.; Wegwerth, Arthur A.; Koeck, Donna M.; and Cobb, Sanford, Jr., 4,128,685, Cl. 428-212.000.
Koehler, Howard A.: *See*—
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Koehler, Waldemar: *See*—
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Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, to Bayer Aktiengesellschaft; and Faserwerke Huls Gesellschaft mit beschrankter Haftung. Process for the production of high molecular weight polyesters. 4,128,533, Cl. 528-279.000.
Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, to Bayer Aktiengesellschaft; and Faserwerke Huls Gesellschaft mit beschrankter Haftung. Process for the production of high molecular weight polyesters. 4,128,534, Cl. 528-279.000.
Kojima, Takakazu; and Ohtsuka, Yozo, to Sagami Chemical Research Center. Process for producing 4-carboxamido-5-cyano-2-imidazolone. 4,128,719, Cl. 548-321.000.
Kokue, Yoshio: *See*—
Shiomura, Tetsunosuke; Kinoshita, Youzou; and Kokue, Yoshio, 4,128,607, Cl. 260-878.00B.
Kolakowski, Richard A.; and Stroud, Richard M., to Upjohn Company, The. Continuous process and apparatus for producing foamed polymer bunstock having a substantially rectangular cross-section. 4,128,611, Cl. 264-51.000.
Kole, Donald R.; and Kossuth, Donald A., to National Gypsum Company. Treated gypsum wallboard paper. 4,128,699, Cl. 428-498.000.
Komori, Tadaaki: *See*—
Kurita, Masaru; Jomon, Kazuyoshi; Komori, Tadaaki; Nakatani, Isami; and Tsuji, Masahiro, 4,128,546, Cl. 260-239.00A.
Komorita, Fujio; and Nakahara, Muneo, to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho. Optical glass. 4,128,432, Cl. 106-53.000.
Komulainen, Pekka, to Oy Wartsila AB. Method for regulating a winding process. 4,128,213, Cl. 242-66.000.
Kondo, Norio: *See*—
Ura, Shigeru; Kondo, Norio; Fukuyama, Yoshiya; and Nakahara, Makoto, 4,128,437, Cl. 106-287.240.
Kondoh, Junichi: *See*—
Ogura, Hajime; Asakawa, Haruma; Kondoh, Junichi; Nakamura, Masashi; and Oyaide, Sadamu, 4,128,068, Cl. 114-26.000.
Kondrashov, Eduard K.: *See*—
Shustova, Olga A.; Gladyshev, Georgy P.; Kondrashov, Eduard K.; and Shustov, Leonid D., 4,128,707, Cl. 526-43.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Nagano, Akira; Urasaki, Kazuaki; Osato, Akira; and Sakurai, Isao, 4,128,756, Cl. 235-92.0SB.
Ohta, Hideyasu; Uozumi, Takahiro; Kanbe, Masaru; Abe, Naoto; Shirasaki, Jun; and Mayama, Masayoshi, 4,128,426, Cl. 96-87.00R.
Kopera, Joseph J.: *See*—
Balan, Isadore; and Kopera, Joseph J., 4,128,091, Cl. 123-148.00E.
Kopp, Eugen, to Werner & Pfleiderer. Device for pressing out material in the form of a strand. 4,128,371, Cl. 425-192.00R.
Kori, Seiji: *See*—
Hayashi, Masaki; Kori, Seiji; and Miyake, Hajimu, 4,128,720, Cl. 560-9.000.
Korotkevich, Boris S.: *See*—
Liakumovich, Alexandr G.; Pantukh, Boris I.; Sultanova, Mengzda K.; Popov, Vasily P.; Tolstikov, Genrikh A.; Monakov, Jury B.; Juriev, Valery P.; Mandelshtam, Elena Y.; Korotkevich, Boris S.; and Shmuk, Jury A., 4,128,708, Cl. 526-162.000.
Kosco, James L.: *See*—
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Kossuth, Donald A.: *See*—
Kole, Donald R.; and Kossuth, Donald A., 4,128,699, Cl. 428-498.000.
Kotcharian, Michel, to Technigaz. Method of mounting a heat-insulating composite wall structure in a liquefied gas transportation and/or storage tank. 4,128,069, Cl. 114-74.00A.
Kotera, Nobuo; and Miyamoto, Nobuo, to Hitachi, Ltd. Method for producing an InSb thin film element. 4,128,681, Cl. 428-138.000.
Kothe, Norbert: *See*—
Merkel, Wulf; Alpermann, Hans G.; Geisen, Karl; Kothe, Norbert; and Ried, Walter, 4,128,643, Cl. 424-251.000.
Kovats, Lawrence H. G., to Mayfran, Incorporated. Endless belt conveyor system. 4,128,166, Cl. 198-860.000.
Koyama, Masao; and Seki, Shigeo, to Meiji Seika Kaisha Ltd. Process for the preparation of 7-acylamida-3-halo-3-alkyl-cepham-4-carboxylic acids and esters. 4,128,714, Cl. 544-18.000.
Koyo Sangyo Co., Ltd.: *See*—
Kikuchi, Katsuro; Masai, Shohachi; and Tanaka, Tsugane, 4,128,695, Cl. 428-423.000.
Kracker, Denis J.: *See*—
Robinson, Ernest G., Jr., 4,128,846, Cl. 358-82.000.
Kraemer, John F.: *See*—
Traxler, James T.; Lira, Emil P.; and Kraemer, John F., 4,128,263, Cl. 282-27.500.
Kraftwerk Union Aktiengesellschaft: *See*—
Becker, Bernard, 4,127,988, Cl. 60-39.660.
Krall, Heribert A.; and Maag, Helmut, to Technica-Guss GmbH. Continuous casting assembly. 4,128,122, Cl. 164-438.000.
Krapf, Rudolf: *See*—
Rohr, Franz-Josef; and Krapf, Rudolf, 4,128,469, Cl. 204-195.00S.
Krause, Walter: *See*—
Reichert, Wolfgang, 4,127,970, Cl. 52-63.000.
Kreiger, John W.: *See*—
Jablonski, Charles E.; and Kreiger, John W., 4,127,976, Cl. 53-450.000.
Krepps, James E., Jr., to Sarkes Tarzian, Inc. Combination VHF and UHF tuner arrangement. 4,128,820, Cl. 334-1.000.
Krickl, Josef: *See*—
Fairley, John; Krickl, Josef; and Weber, Robert, 4,128,755, Cl. 235-92.00T.
Kroker, Ruprecht; and Sander, Hans, to BASF Aktiengesellschaft. Baking finishes of low solvent content. 4,128,521, Cl. 260-31.40R.
Krueger, Friedrich; and Palleduhn, Dieter, to Joh. A. Benckiser GmbH. Process of producing a cyclohexane-1,2,3,4-tetracarboxylic acid-containing scale inhibitor. 4,128,492, Cl. 252-180.000.
Kuan, Tiong H.: *See*—
Britton, James E.; Metcalf, Fredric D.; Sommer, John G.; Kuan, Tiong H.; Rilling, Victor R.; and Welch, John A., 4,128,523, Cl. 260-33.6AQ.
Kubota, Naohiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,128,608, Cl. 260-880.00R.
Kulka, Kurt; Mild, Frank; and Fischetti, Frank, Jr., to Fritzsche Dodge & Olcott Inc. Tobacco compositions containing 3-ethoxy-4-hydroxybenzaldehyde 2,2-dimethyl propanediol acetal. 4,128,101, Cl. 131-17.00R.
Kummerle, Kurt; Heise, Hartmut; and Hille, Ernst, to Hoechst Aktiengesellschaft. Process for the manufacture of 3-hydroxybutyric acid arylamides with trialkyl phosphate and substituted phosphine promotor. 4,128,578, Cl. 260-562.00R.
Kundikoff, Peter. Cutting guide square. 4,128,030, Cl. 83-745.000.
Kunii, Kazuya, to Nissan Motor Company, Limited. Engine mechanical loss reducing system. 4,128,085, Cl. 123-75.00E.
Kupka, Dieter. Stirring mechanism for a clearing vat employed in breweries. 4,128,019, Cl. 74-424.80R.
Kurihara, Tomomichi: *See*—
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,128,187, Cl. 220-464.000.
Kurita, Masaru; Jomon, Kazuyoshi; Komori, Tadaaki; Nakatani, Isami; and Tsuji, Masahiro, to Fujisawa Pharmaceutical Co., Ltd. Process for the purification of FR-1923 substance. 4,128,546, Cl. 260-239.00A.
Kurtz, Leonard D.; and Ludwig, Philip, to Deknatel Inc. Sternotomy surgical needle. 4,128,351, Cl. 128-305.000.
Kusakabe, Takaaki: *See*—
Shiokawa, Showko; Kusakabe, Takaaki; Moriizumi, Toyosaka; and Yasuda, Tsutomu, 4,128,819, Cl. 333-72.000.
Kusumoto, Sho: *See*—
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Kuwabara, Hideo: *See*—
Yamamoto, Yoshihiko; Shigenobu, Masahiro; and Kuwabara, Hideo, 4,128,768, Cl. 250-535.000.
Kuwazawa, Hiroyasu: *See*—
Yoshino, Masataka; Matsuno, Nobuyoshi; Kuwazawa, Hiroyasu; and Nomaguchi, Tomatsu, 4,128,390, Cl. 431-242.000.
Kydonieus, Nicholas, to Pennwalt Corporation. Method of washing polymer latices by aerating. 4,128,517, Cl. 260-29.60F.
Kyle, William; and Lee, Bruce H. Management of incontinence. 4,128,686, Cl. 428-219.000.
Laboratories OM Societe Anonyme: *See*—
Schulthess, Adrian; and de Courten, Alfred, 4,128,661, Cl. 424-316.000.
Laciak, Francis M.: *See*—
Strunc, Gerald R.; and Laciak, Francis M., 4,128,887, Cl. 364-475.000.
Lafferty, James M., to General Electric Company. High-current vacuum switch with reduced contact erosion. 4,128,748, Cl. 200-144.00B.
Lafon, Louis, to Societe Anonyme Dite: Laboratoire L. Lafon. Piperonylamine derivatives. 4,128,656, Cl. 424-282.000.
Lafuente Ruberte, Antonio. Vehicle speed reducer or eddy current brake. 4,128,147, Cl. 188-164.000.
Lamage Limited: *See*—
Generoux, Robert E., 4,128,136, Cl. 175-330.000.

Lambert Brake Corporation: *See*—
Euler, John W., 4,128,145, Cl. 188-71.200.

Lambert, Robert W.: *See*—
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Samuel, Robert A.; Kaminski, Gerald W.; and Layne, Michael W., 4,127,939, Cl. 32-11.000.

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Bustos, Rafael T., 4,128,177, Cl. 211-49.00D.

Legueu, Paul E. R. Vehicle flooring construction. 4,128,270, Cl. 296-28.00R.

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Pavlak, Daniel E.; and Levenson, Michael, 4,128,443, Cl. 149-71.000.

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Melles, Leo W. A., 4,128,491, Cl. 252-95.000.
Sale, Anthony J. H., 4,128,751, Cl. 219-10.55A.

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Headen, William E.; and Levesque, George N., 4,128,278, Cl. 308-3.00A.

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Kabelitz, Hans-Peter; and Sideris, Nikolas, 4,128,248, Cl. 277-15.000.
Polaschegg, Hans-Dietrich, 4,128,763, Cl. 250-305.000.

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Ennis, Robert E., 4,128,474, Cl. 209-2.000.

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Burness, Arnold M.; Ling, Hans G.; and Doppen, Glen M., 4,128,538, Cl. 260-884.000.

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Traxler, James T.; Lira, Emil P.; and Kraemer, John F., 4,128,263, Cl. 282-27.500.

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Terekhov, Kuzma I.; Tumanov, Alexei T.; Ozerova, Alexandra P.; Topilin, Valentin V.; Dzugutov, Mikhail Y.; Ljubinskaya, Mara A.; Pashchnik, Gennady A.; Nikishov, Alexandr S.; and Ustinov, Terenty I., 4,128,419, Cl. 75-171.000.

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Loeffler, Herbert H., to Woodstream Corporation. Low impact animal trap. 4,127,959, Cl. 43-88.000.

Loeser, Werner: *See*—
Wunsch, Gerd; Deigner, Paul; Falk, Roland; Mahler, Karl; Loeser, Werner; Domas, Friedrich; Felleisen, Peter; and Steck, Werner, 4,128,672, Cl. 427-130.000.

Logan, Thomas D.; and Nelson, Edwin S. Snap lock handle. 4,127,915, Cl. 16-114.00R.

Loos, Karl D., II; McCullough, Kenneth C.; and Whitworth, Don Q.,

to Du Pont de Nemours, E. I., and Company. Process for producing hydrogen cyanide. 4,128,622, Cl. 423-376.000.

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Lowther, Frank E., to W. R. Grace & Co. Method and apparatus for operating a gaseous discharge lamp with improved efficiency. 4,128,788, Cl. 315-176.000.

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Lubrizol Corporation, The: *See*—
Steckel, Thoams F., 4,128,488, Cl. 252-33.600.

Luce, John S., to United States of America, Energy. Collective field accelerator. 4,128,764, Cl. 250-398.000.

Lucke, Florian, to Croon & Lucke Maschinenfabrik GmbH & Co. KG. Device for placing a band on a ball. 4,127,978, Cl. 53-585.000.

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Fugitt, Robert B.; and Luckenbaugh, Raymond W., 4,128,654, Cl. 424-272.000.

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Kurtz, Leonard D.; and Ludwig, Philip, 4,128,351, Cl. 128-305.000.

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Lundblad, Leif, to Inter Innovation AB. Sheet feeding apparatus. 4,128,236, Cl. 271-10.000.

Lundmark, Larry D.; Melby, Allan; and Chun, Ho-Ming, to General Mills Chemicals, Inc. Method of imparting lubricity to keratinous substrates and mucous membranes. 4,128,631, Cl. 424-70.000.

Lundquist, David E.: *See*—
Brown, Michael K.; Christou, Kyriakos; Lundquist, David E.; Maidment, Earl P.; and Shell, Ronald G., 4,128,841, Cl. 346-75.000.

Lung, Bernhard. Procedure for the preparation of refined materials containing SiC and/or FeSi. 4,128,417, Cl. 75-129.000.

Luwa AG: *See*—
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Lynch, David J., to Rentokil Limited. Sulfur dioxide liberation compositions and methods of using same. 4,128,397, Cl. 422-29.000.

Lynch, Donald M.: *See*—
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,128,662, Cl. 424-319.000.

M & W Gear Company: *See*—
Coldren, Kenneth M., 4,128,255, Cl. 280-143.000.

Maag Gear-Wheel & Machine Co. Ltd.: *See*—
Aschwanden, Paul F.; and Bartosek, Milan, 4,128,093, Cl. 125-11.00T.

Maag, Helmut: *See*—
Krall, Heribert A.; and Maag, Helmut, 4,128,122, Cl. 164-438.000.

Maas, Henricus J. Device for winding a bobbin. 4,128,214, Cl. 242-67.30R.

MacKay, Kenneth D.; and Rogier, Edgar R., to General Mills Chemicals, Inc. Compositions useful in process for extraction of metal values from acidic solutions. 4,128,493, Cl. 252-184.000.

Mackenzie King Holdings Limited: *See*—
King, Peter G., 4,128,284, Cl. 312-330.00R.

MacLeod, Donald A. Automatic resetting control circuit for air switch operator. 4,128,856, Cl. 361-156.000.

Madsen, Elmer W., to North American Philips Corporation. Magnetically actuated indicator. 4,128,825, Cl. 335-272.000.

Maerfeld, Charles: *See*—
Tournois, Pierre; and Maerfeld, Charles, 4,128,615, Cl. 310-313.000.

Magee, Thomas A., to Diamond Shamrock Corporation. Ketoxime carbamates. 4,128,581, Cl. 260-566.0AC.

Magnollay, Gilbert, to Maillefer S.A. Apparatus for insulating and treating electrical conductors. 4,128,368, Cl. 425-113.000.

Magnuson, Robert E.: *See*—
Sauvey, Donald R.; and Magnuson, Robert E., 4,128,036, Cl. 84-441.000.

Magosch, Karl-Heinz: *See*—
Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, 4,128,533, Cl. 528-279.000.
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Maher, James, to Xerox Corporation. Waveguide optical modulator. 4,128,299, Cl. 350-96.130.

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Mahler, Karl: *See*—
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Maidment, Earl P.: *See*—
Brown, Michael K.; Christou, Kyriakos; Lundquist, David E.; Maidment, Earl P.; and Shell, Ronald G., 4,128,841, Cl. 346-75.000.

Maier, Fred, to Festo-Maschinenfabrik Gottlieb Stoll. Apparatus for processing workpieces in the form of short-length elongate timber waste into usable timber. 4,128,119, Cl. 144-317.000.

Mailander, Hans: *See*—
Loch, Friedhelm H.; Mailander, Hans; Riemath, Heinz; Schmid, Richard; and Stickel, Ernst, 4,128,287, Cl. 312-253.000.

Maillefer S.A.: *See*—
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Main, Doug: *See*—
Main, Harvey M.; and Main, Doug, 4,128,025, Cl. 81-58.100.

Main, Harvey M.; and Main, Doug. Bolt starting device. 4,128,025, Cl. 81-58.100.

Main, Peter L., to Holset Engineering Company Limited. Viscous shear fluid couplings. 4,128,153, Cl. 192-58.00B.

Makino, Kiyoji; and Ohkawa, Tsutomu, to Toshiba Chemical Products Co. Ltd. Thermosetting resin compositions having excellent high temperature characteristics. 4,128,598, Cl. 260-837.00R.

Malchesky, Paul S.; and Nose, Yukihiko, to Japan Foundation For Artificial Organs. Blood-gas exchanger. 4,128,479, Cl. 210-321.00B.

Malissin, Roland: *See*—
Lehureau, Jean-Claude; Malissin, Roland; and Roullet, Gerald, 4,128,309, Cl. 350-295.000.

Malminen, Henrikki; and Martikainen, Kaarlo, to Oy Wartsila AB. Key profile system. 4,127,996, Cl. 70-365.000.

Malone, Huey P.; Paraskos, John A.; and Taylor, Herman, Jr., to Gulf Research & Development Company. Coal liquefaction process employing carbon monoxide. 4,128,471, Cl. 208-8.000.

Malpass, Dennis B.: *See*—
Smith, William N.; Malpass, Dennis B.; and Merkley, Joseph H., 4,128,501, Cl. 252-431.00R.

Maltby, Edgar W., to Eaton Corporation. Four-port thermally responsive valve. 4,128,203, Cl. 236-100.000.

Mandelshtam, Elena Y.: *See*—
Liakumovich, Alexandr G.; Pantukh, Boris I.; Sultanova, Mengzda K.; Popov, Vasily P.; Tolstikov, Genrikh A.; Monakov, Jury B.; Juriev, Valery P.; Mandelshtam, Elena Y.; Korotkevich, Boris S.; and Shmuk, Jury A., 4,128,708, Cl. 526-162.000.

Manning, William R., to Champion Spark Plug Company. Dense and impervious stabilized hafnium oxide ceramic. 4,128,433, Cl. 106-55.000.

Mannington Mills, Inc.: *See*—
Wiley, John W., 4,128,688, Cl. 428-311.000.

Manzini, Ferruccio, deceased; and Manzini, Laura C., administratrix, to Benditalia S.p.A. Seal for a variable ratio hydraulic master cylinder. 4,128,249, Cl. 277-182.000.

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Manzini, Ferruccio, deceased; and Manzini, Laura C., administratrix, 4,128,249, Cl. 277-182.000.

Maple, James A.: *See*—
Kaigler, Noyle B., Jr., deceased; Kaigler, Mary A., executrix; Hochstein, Spence L.; and Maple, James A., 4,128,219, Cl. 248-55.000.

Marchant, David D.: *See*—
Boquist, Carl W.; and Marchant, David D., 4,128,776, Cl. 310-11.000.

Maricle, Donald L., to United Technologies Corp. Hydrogen/chlorine regenerative fuel cell. 4,128,701, Cl. 429-21.000.

Markezich, Ronald L.; and Takekoshi, Tohru, to General Electric Company. Method for making organic polycarboxylic acids. 4,128,574, Cl. 562-473.000.

Markiewitz, Kenneth H. Process for preparing ethylenically unsaturated isocyanurates. 4,128,537, Cl. 528-49.000.

Marks, Eugene A., to Transducers, Inc. Parallel beam load cell insensitive to point of application of load. 4,128,001, Cl. 73-1.00B.

Mars, Inc.: *See*—
Henville, Michael I., 4,128,157, Cl. 194-97.00R.

Marsh, Harold G.; and Pierret, James A., to Dressler, Goldsmith, Clements, Gordon & Shore, Ltd. Embrittlement-resistant tantalum wire. 4,128,421, Cl. 75-251.000.

Marsilio, Dominic O.; and O'Bryan, Edwin J., to Continental-Wirt Electronics Corporation. Slide switch with snap-action detent means. 4,128,745, Cl. 200-16.00C.

Martel, Jacques; and Tessier, Jean, to Roussel Uclaf. Optically active sulfonates of allethrolone. 4,128,584, Cl. 260-586.00R.

Martikainen, Kaarlo: *See*—
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Martin, William E.: *See*—
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Martinez, Carlos J.: *See*—
Tobias, Michael A.; and Martinez, Carlos J., 4,128,515, Cl. 260-18.0EP.

Marvin Glass & Associates: *See*—
Hicks, Alan A.; Spinello, John O.; and Breslow, Jeffrey D., 4,128,246, Cl. 273-243.000.

Marxer S.p.A.: *See*—
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Masai, Shohachi: *See*—
Kikuchi, Katsuro; Masai, Shohachi; and Tanaka, Tsugane, 4,128,695, Cl. 428-423.000.

Masaki, Seishi: *See—*
Nishimura, Hideo; Masaki, Seishi; Miyauchi, Takao; and Kobayashi, Nariyoshi, 4,128,460, Cl. 204-35.00N.

Masonite Corporation: *See—*
Daunheimer, Lyn R., 4,128,076, Cl. 118-70.000.

Massa, Frank, to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees, The Stoneleigh Trust. Manufacture of electroacoustic transducers which require molding an elastomer to the surface of the transducer material. 4,128,370, Cl. 425-128.000.

Massachusetts Institute of Technology: *See—*
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Kaplow, Roy; and Frank, Robert I., 4,128,732, Cl. 136-89.0PC.

Masuda, Takao: *See—*
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Materials Recovery Corporation: *See—*
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Mathews, Marion J.: *See—*
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Matono, Hirokuni: *See—*
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Matsui, Motoaki: *See—*
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Matsui, Toshio, to Minolta Camera Kabushiki Kaisha. Developing electrode type electrostatic copying machines. 4,128,328, Cl. 355-3.0DD.

Matsumoto, Kent E.; Chan, Jimmy H.; and Baker, Don R., to Stauffer Chemical Company. Process for the production of 1,3-dichloroacetone oxime and its acetate derivative. 4,128,580, Cl. 260-566.00A.

Matsuno, Nobuyoshi: *See—*
Yoshino, Masataka; Matsuno, Nobuyoshi; Kuwazawa, Hiroyasu; and Nomaguchi, Tomatsu, 4,128,390, Cl. 431-242.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Wada, Ryoichi; Fujisaki, atsumi; Nakajima, Masaya; Tsunoo, Masahiko; and Kimura, Takeji, 4,128,032, Cl. 84-1.010.

Mattel, Inc.: *See—*
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Matthies, Bruce J.: *See—*
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Maubon, Andre, to Clesid S.A. Installation for the collection of gases emitted by a tiltable converter. 4,128,230, Cl. 266-89.000.

Mayama, Masayoshi: *See—*
Ohta, Hideyasu; Uozumi, Takahiro; Kanbe, Masaru; Abe, Naoto; Shirasaki, Jun; and Mayama, Masayoshi, 4,128,426, Cl. 96-87.00R.

Mayfran, Incorporated: *See—*
Kovats, Lawrence H. G., 4,128,166, Cl. 198-860.000.

Mazelsky, Bernard, to ARA, Inc. System for isolating floor vibration and distortions from an object such as an aircraft seat. 4,128,217, Cl. 244-122.00R.

McBride, Willis M. Anti-recoil boot. 4,127,953, Cl. 42-1.00W.

McCaskill, Kenneth B.: *See—*
Karr, Clarence, Jr.; and McCaskill, Kenneth B., 4,128,473, Cl. 208-108.000.

McCluskey, John J., to Owens-Corning Fiberglas Corporation. Thickening agents for low pressure molding compositions. 4,128,601, Cl. 260-862.000.

McComas, Arthur D., to Bendix Corporation, The. Means for accumulating aircraft position data for a beacon based collision avoidance system and other purposes. 4,128,839, Cl. 343-112.0CA.

McCord, Daniel, to Ideal Industries, Inc. Cable clamps. 4,128,294, Cl. 339-266.00R.

McCrudden, Joseph E., to Interox Chemicals Limited. Bleaching composition. 4,128,495, Cl. 252-186.000.

McCullough, Foy: *See—*
Corey, Bernard S., 4,128,104, Cl. 135-3.00R.

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Loos, Karl D., II; McCullough, Kenneth C.; and Whitworth, Don Q., 4,128,622, Cl. 423-376.000.

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Abercrombie, Bolling A., 4,128,106, Cl. 137-155.000.

McNaney, Joseph T. Optical system for changing the cross sectional dimensions of a collimated beam of light. 4,128,308, Cl. 350-286.000.

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Koyama, Masao; and Seki, Saigeo, 4,128,714, Cl. 544-18.000.

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Bucher, David H.; and Meinert, Harry M., 4,128,131, Cl. 172-311.000.

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Merchant, Dihrendra R., to Pennwalt Corporation. Purification of gaseous hydrogen chloride. 4,128,626, Cl. 423-488.000.

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Lowrey, Robert D.; Wegwerth, Arthur A.; Koeck, Donna M.; and Cobb, Sanford, Jr., 4,128,685, Cl. 428-212.000.
Mickelson, Norman W., 4,128,290, Cl. 339-97.00R.
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Mitchhart, Ray M.; and Zingl, Hans, to Gardner-Denver Company. Drill pipe handling mechanism. 4,128,135, Cl. 175-52.000.
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Yamamoto, Yoshihiko; Shigenobu, Masahiro; and Kuwabara, Hideo, 4,128,768, Cl. 250-535.000.
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Ogura, Hajime; Asakawa, Haruma; Kondoh, Junichi; Nakamura, Masashi; and Oyaide, Sadamu, 4,128,068, Cl. 114-26.000.
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Mitsubishi Rayon Co., Ltd.: *See—*
Kishida, Kazuo; Kobayashi, Jinpee; and Fukunaga, Hajime, 4,128,605, Cl. 260-876.00R.
Mitsubishi Yuka Pharmaceutical Co., Ltd.: *See—*
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Mixon, James L., Jr.; and Werner, Walter M., to AMP Incorporated. Ignitor assembly. 4,128,058, Cl. 102-28.00R.
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Mobil Oil Corporation: *See—*
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Mikovsky, Richard J.; and Silvestri, Anthony J., 4,128,505, Cl. 252-465.000.
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,128,504, Cl. 252-455.00Z.
Tobias, Michael A.; and Martinez, Carlos J., 4,128,515, Cl. 260-18.0EP.
Moen, Lowell J.; and Olson, Harris S., to Caterpillar Tractor Co. Ground-engaging tool inserts with angled edges. 4,128,132, Cl. 172-747.000.
Moked, Isaac; Yi, Kenneth C.; McDonald, John O.; and Lee, Jannan G., to Union Carbide Corporation. Apparatus for blending granular materials. 4,128,343, Cl. 366-101.000.
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Woolston, Allan B., 4,128,886, Cl. 364-475.000.
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van den Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 4,127,916, Cl. 15-250.420.
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Houbion, John A., 4,128,576, Cl. 260-544.00D.
Schleppnik, Alfred A., 4,128,509, Cl. 252-522.000.
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Moody, Keith, to ICI Australia Limited. Nona- and deca-peptide amide derivatives demonstrating high ovulation inducing activity. 4,128,638, Cl. 424-177.000.
Moore, Arthur R. Tandem wheel suspension for a vehicle frame. 4,128,260, Cl. 280-676.000.
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Morera, Gonzalo A. Racing board game device. 4,128,241, Cl. 273-246.000.
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Morishima, Toshio, to Robert Bosch GmbH. Semi-conductor voltage regulator, particularly for automotive use. 4,128,799, Cl. 322-28.000.
Morley, Robert C.: *See—*
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Morrison, Glenn C.: *See—*
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Morrow, Otis L. Drainage structure forming method. 4,127,990, Cl. 405-36.000.
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Gardner, Harry N., 4,128,879, Cl. 365-73.000.

Graziano, Victor, 4,128,740, Cl. 179-2.0EB.
Prioste, Jerry E., 4,128,872, Cl. 364-900.000.
Valek, Robert J.; and Gartner, Todd H., 4,128,885, Cl. 364-424.000.

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Munker, Gert, to Palitex Project Company GmbH. Yarn guiding and threading mechanisms for use with textile yarn processing machines. 4,127,983, Cl. 57-279.000.

Muntean, Andy. Drive wheel. 4,128,018, Cl. 74-413.000.

Murad, Sammy Y., to Wahlco Inc. High voltage DC power supply. 4,128,871, Cl. 363-144.000.

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Myerson, Elliott L.; and Gillis, Richard W. Pressure bar for a capo tasto. 4,128,034, Cl. 84-318.000.

Nachbur, Hermann; Hiestand, Armin; and Rohringer, Peter, to Ciba-Geigy Corporation. Process for fireproofing polyester fiber materials with substituted sulphurylamides. 4,128,687, Cl. 428-253.000.

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Nagao, Masato; and Kusumoto, Sho, to Hitachi, Ltd. Apparatus for measuring mechanical stress using white X-rays. 4,128,762, Cl. 250-272.000.

Nagati, Rashed N., to Pennsylvania Engineering Corporation. Cooling assembly for metallurgical vessels. 4,128,232, Cl. 266-241.000.

Naito, Kiyoshi; and Sukuya, Akio, to Shinagawa Refractories Co., Ltd. Tunnel kiln for use in rebaking carbonaceous moldings impregnated with tar, pitch or the like. 4,128,394, Cl. 432-137.000.

Nakagawa, Isao, to Hitachi, Ltd. Automatic ghost-suppression system. 4,128,848, Cl. 358-167.000.

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Nakamura, Masashi: *See—*
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National Research Development Corporation: *See—*
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National Semiconductor Corporation: *See—*
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National Starch and Chemical Corporation: *See—*
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National Storage Systems, Inc.: *See—*
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Nelsen, Suzanne B.: *See—*
Brodsky, Lee; Lorenz, Donald H.; Nelsen, Suzanne B.; and Tu, Shu T., 4,128,536, Cl. 427-54.000.

Nelson, Edwin S.: *See—*
Logan, Thomas D.; and Nelson, Edwin S., 4,127,915, Cl. 16-114.00R.

Nelson, James A.: *See—*
Lazarus, Harrison; and Nelson, James A., 4,128,173, Cl. 206-570.000.

Nelson, Norman A., to Upjohn Company, The. 15-Methyl- and 16-phenoxy-$PGF_2\alpha$, amides. 4,128,577, Cl. 260-559.00B.

New Jersey Zinc Company, The: *See—*
Robinson, Victor S.; and Eshelman, Donald M., 4,128,619, Cl. 423-244.000.

New Nippon Electric Company, Ltd.: *See—*
Kato, Kazuo; and Narihiro, Michiaki, 4,128,821, Cl. 334-51.000.

New Pneumatics, Inc.: *See—*
Schmidt, Oscar W., 4,127,966, Cl. 49-141.000.

Newcomb, Nelson F.; and Newcomb, Nelson F., Jr. Practice baseball. 4,128,238, Cl. 273-26.00R.

Newcomb, Nelson F., Jr.: *See—*
Newcomb, Nelson F.; and Newcomb, Nelson F., Jr., 4,128,238, Cl. 273-26.00R.

Newell, William H., to Perkin-Elmer Corporation, The. Two axis flexure. 4,128,352, Cl. 403-57.000.

Newman, Douglas A.; and Emerson, Robert T., to Columbia Ribbon and Carbon Manufacturing Co., Inc. Master sheets and process for printing same. 4,128,430, Cl. 106-31.000.

Newmont Exploration Limited: *See—*
DeGuire, Marcel F.; and Wirag, John H., III, 4,128,617, Cl. 423-106.000.

Nguyen, Van-Tran: *See—*
Chang, Tao-Yuan; Damen, Theodoor C.; and Nguyen, Van-Tran, 4,128,772, Cl. 307-88.300.

Ni-Tec, Inc.: *See—*
Fender, Ferdinand G.; and Tegethoff, Jon E., 4,128,340, Cl. 356-218.000.

Niblett, David C.; and Capewell, James T., to Simon-Hartley Limited. Lifting beam. 4,128,267, Cl. 294-81.00R.

Nicholson, John S.: *See—*
Adams, Stewart S.; Armitage, Bernard J.; Nicholson, John S.; and Tantum, James G., 4,128,573, Cl. 562-465.000.

Nicolaides, Ernest D.: *See—*
Rebstock, Mildred C.; Nicolaides, Ernest D.; Mick, Thomas F.; Tinney, Francis J.; and Wittle, Eugene L., 4,128,540, Cl. 260-112.50R.

Nighswonger, James; and Spector, George. Pressurized coating container with depth of color indicator. 4,128,193, Cl. 222-402.210.

Nikishov, Alexandr S.: *See—*
Terekhov, Kuzma I.; Tumanov, Alexei T.; Ozerova, Alexandra P.; Topilin, Valentin V.; Dzugutov, Mikhail Y.; Ljubinskaya, Mara A.; Pashchnik, Gennady A.; Nikishov, Alexandr S.; and Ustinov, Terenty I., 4,128,419, Cl. 75-171.000.

Nikitchenko, Vladimir F.: *See—*
Shakula, Nikolai M.; Voloschenko, Nikolai I.; Shishkin, Nikolai F.; Muratov, Anatoly S.; Guzchenko, Alexandr P.; Anokhin, Vladimir M.; and Nikitchenko, Vladimir F., 4,128,367, Cl. 425-11.000.

Nippon Electric Co., Ltd.: *See—*
Kage, Kouzou, 4,128,809, Cl. 325-324.000.
Shiba, Hiroshi, 4,127,931, Cl. 29-571.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Ogita, Minoru, 4,128,810, Cl. 325-398.000.

Nippon Oil and Fats Co. Ltd.: *See—*
Ishida, Shiro; Funatsuki, Genuemon; Izaiku, Hiromi; and Hirano, Jiro, 4,128,483, Cl. 252-8.600.

Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See—*
Yamauchi, Shin; Yonehara, Kiyoshi; Horie, Koshi; Ono, Tetsuji; and Ohara, Takashi, 4,128,503, Cl. 252-435.000.

Nippon Soken, Inc.: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,128,081, Cl. 123-32.0SP.

Nippon Telegraph and Telephone Public Corp.: *See—*
Kawaguchi, Hitoshi; and Furukawa, Yoshitaka, 4,128,815, Cl. 331-94.50H.
Sakai, Tetsushi, 4,128,845, Cl. 357-51.000.
Samejima, Shuichi; and Hirade, Kenkichi, 4,128,828, Cl. 340-146.1AQ.
Nishiba, Kenzo, to Teijin Seiki Company Limited. Radial piston type hydraulic pump-motor. 4,128,048, Cl. 91-491.000.
Nishikawa, Akio: *See—*
Kinjo, Noriyuki; Nishikawa, Akio; Katagiri, Junichi; Yokono, Hitoshi; Ikeda, Tamotsu; and Kobayashi, Tsuguo, 4,128,527, Cl. 260-42.180.
Nishimoto, Tsunanori: *See—*
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,128,187, Cl. 220-464.000.
Nishimura, Hideo; Masaki, Seishi; Miyauchi, Takao; and Kobayashi, Nariyoshi, to Daiwa Kasei Kenkyujo Kabushiki Kaisha. Coloring by electrolysis of aluminum or aluminum alloys. 4,128,460, Cl. 204-35.00N.
Nissan Motor Company, Limited: *See—*
Aoyama, Syunichi, 4,128,090, Cl. 123-119.00A.
Hayashi, Makio; and Hisatomi, Takashi, 4,128,087, Cl. 123-103.00E.
Kunii, Kazuya, 4,128,085, Cl. 123-75.00E.
Tanaka, Shigenori, 4,128,114, Cl. 139-435.000.
Niven, Ralph E., to White-Westinghouse Corporation. Oil stirrer for refrigeration compressor. 4,127,994, Cl. 62-469.000.
Nixdorf Computer AG: *See—*
Huellwegen, Josef, 4,128,743, Cl. 179-170.00R.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Torch ignition type internal combustion engine. 4,128,081, Cl. 123-32.0SP.
Nohara, Masaru: *See—*
Ojima, Shin; Ohgami, Kazuhiko; Watanabe, Kazutaka; Nohara, Masaru; and Yamamoto, Kenji, 4,128,889, Cl. 364-705.000.
Nomaguchi, Tomatsu: *See—*
Yoshino, Masataka; Matsuno, Nobuyoshi; Kuwazawa, Hiroyasu; and Nomaguchi, Tomatsu, 4,128,390, Cl. 431-242.000.
Nomura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Auto ceiling panel and its manufacturing method. 4,128,682, Cl. 428-138.000.
Nomura, Takao; Umemoto, Yos' .o; and Sakamoto, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Auto ceiling panel and its manufacturing process. 4,128,683, Cl. 428-138.000.
Norstrom, Gote J. W., to Uddeholms Aktiegolag. Degreasing apparatus. 4,128,103, Cl. 134-143.000.
North American Philips Corporation: *See—*
Madsen, Elmer W., 4,128,825, Cl. 335-272.000.
North:p, John D. Child-proof container and cap. 4,128,184, Cl. 215-222.000.
Norton, James F.; Parks, Harold G.; and Possin, George E., to General Electric Company. Archival memory media and method for information recording thereon. 4,128,897, Cl. 365-118.000.
Nose, Yukihiko: *See—*
Malchesky, Paul S.; and Nose, Yukihiko, 4,128,479, Cl. 210-321.00B.
Nothen, Karl; Creixell, Francisco B.; and Ehrig, Bodo, to Bayer Aktiengesellschaft. Process and a dryer for drying polychloroprene sheets. 4,127,945, Cl. 34-18.000.
Nozawa, Kazutoshi; Ashibe, Yasue; Aruga, Hatsuo; and Tatsuzawa, Kunio, to Rhythm Watch Co., Ltd. Pendulum clock mechanism. 4,127,986, Cl. 58-134.000.
NRM Corporation: *See—*
Cantarutti, Armindo, 4,128,450, Cl. 156-417.000.
NSK-Warner, K.K.: *See—*
Mita, Akira, 4,127,922, Cl. 24-230.00A.
NTN Toyo Bearing Company Limited: *See—*
Hioki, Issaku, 4,128,216, Cl. 242-199.000.
Ohashi, Yasuji; and Mitani, Yoichiro, 4,128,796, Cl. 318-636.000.
Nutt, Wendell G.; and Roach, Mark E., to Bell Telephone Laboratories, Incorporated. Cable design with limited color coding. 4,128,736, Cl. 174-112.000.
O.A.H. Homes (Proprietary) Ltd.: *See—*
Hansen, Otto A. H., 4,128,275, Cl. 298-19.00B.
Obiaya, Joseph O. Combustible element and oxygen concentration sensor. 4,128,458, Cl. 204-1.00T.
O'Bryan, Edwin J.: *See—*
Marsilio, Dominic O.; and O'Bryan, Edwin J., 4,128,745, Cl. 200-16.00C.
Occhipinti, Carl, to Bunker Kamo Corporation. Electrical connector having a low insertion force for flat circuit bearing elements. 4,128,289, Cl. 339-75.0MP.
Oce-Nederland B.V.: *See—*
Vosbeek, Gerardus J., 4,128. _3, Cl. 96-49.000.
Oehler, Kenneth L. Photodetector circuit for ballistic velocity measurement. 4,128,761, Cl. 250-222.00R.
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, to Seiko Koki Kabushiki Kaisha. Slip mechanism of clock. 4,127,984, Cl. 58-7.000.
Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. Signal level indicator driving circuit. 4,128,810, Cl. 325-398.000.
Ogura, Hajime; Asakawa, Haruma; Kondoh, Junichi; Nakamura, Masashi; and Oyaide, Sadamu, to Mitsubishi Jukogyo Kabushiki Kaisha. Floating-refuse-collecting boat. 4,128,068, Cl. 114-26.000.
O'Hara, Kevin J.; and Kilvington, Howard J., to Coats Brothers & Company Ltd. Rheological agents. 4,128,436, Cl. 106-243.000.
Ohara, Takashi: *See—*
Yamauchi, Shin; Yonehara, Kiyoshi; Horie, Koshi; Ono, Tetsuji; and Ohara, Takashi, 4,128,503, Cl. 252-435.000.
Ohashi, Yasuji; and Mitani, Yoichiro, to NTN Toyo Bearing Company Limited. Gap eliminator. 4,128,796, Cl. 318-636.000.
Ohgami, Kazuhiko: *See—*
Ojima, Shin; Ohgami, Kazuhiko; Watanabe, Kazutaka; Nohara, Masaru; and Yamamoto, Kenji, 4,128,889, Cl. 364-705.000.
Ohkawa, Tsutomu: *See—*
Makino, Kiyoji; and Ohkawa, Tsutomu, 4,128,598, Cl. 260-837.00R.
Ohngemach, Jorg: *See—*
Baumer, Wilhelm; Bernhard, Horst; Esselborn, Reiner; Ohngemach, Jorg; Stahlecker, Otto; and Zureda, Fritz, 4,128,435, Cl. 106-148.000.
Ohse, Helmut: *See—*
Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, 4,128,533, Cl. 528-279.000.
Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, 4,128,534, Cl. 528-279.000.
Ohta, Hideyasu; Uozumi, Takahiro; Kanbe, Masaru; Abe, Naoto; Shirasaki, Jun; and Mayama, Masayoshi, to Konishiroku Photo Industry Co., Ltd. Process for subbing photographic hydrophobic films. 4,128,426, Cl. 96-87.00R.
Ohtsuka, Yozo: *See—*
Kojima, Takakazu; and Ohtsuka, Yozo, 4,128,719, Cl. 548-321.000.
Ojima, Shin; Ohgami, Kazuhiko; Watanabe, Kazutaka; Nohara, Masaru; and Yamamoto, Kenji, to Hoshidenki-Seizo Kabushiki Kaisha. Pen type electronic digital calculator. 4,128,889, Cl. 364-705.000.
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, to Hitachi Shipbuilding & Engineering Co., Ltd. Secondary barrier construction for low temperature liquified gas storage tank carrying vessels. 4,128,187, Cl. 220-464.000.
Okaniwa, Hiroshi; and Yatabe, Toshiaki, to Teijin Limited. Cell with N,N-bis (substituted phenyl)-4,4- dipyridinium salt depolarizer. 4,128,702, Cl. 429-27.000.
Okazaki, Kunio, to Stanley Electric Co., Ltd. Automatically returning apparatus for turn signal lamp switch. 4,128,770, Cl. 307-10.0LS.
Oki Electric Industry, Co., Ltd.: *See—*
Yasuhara, Hiroshi; and Saito, Seiki, 4,128,878, Cl. 364-200.000.
Oldford, William G., to Huron Tool & Manufacturing Division of U.S. Industries, Inc. Two-piece fitting assembly. 4,128,264, Cl. 285-41.000.
Olin Corporation: *See—*
Vitek, John M., 4,128,418, Cl. 75-157.500.
Olschewski, Armin: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; and Schulz, Toni, 4,128,279, Cl. 308-6.00C.
Olshvang, Mikhail V.: *See—*
Ermolovich, Eduard S.; and Olshvang, Mikhail V., 4,128,869, Cl. 363-87.000.
Olson, Harris S.: *See—*
Moen, Lowell J.; and Olson, Harris S., 4,128,132, Cl. 172-747.000.
Omron Tateisi Electronics Co.: *See—*
Nagano, Akira; Urasaki, Kazuaki; Osato, Akira; and Sakurai, Isao, 4,128,756, Cl. 235-92.0SB.
Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Amino acid derivatives. 4,128,721, Cl. 560-16.000.
Ondetti, Miguel A.: *See—*
Cushman, David W.; and Ondetti, Miguel A., 4,128,653, Cl. 424-267.000.
Onizawa, Masao, to Sanyo Trading Co., Ltd. Curable vinyl chloride resin composition. 4,128,539, Cl. 260-4.00R.
Ono Pharmaceutical Company: *See—*
Hayashi, Masaki; Kori, Seiji; and Miyake, Hajimu, 4,128,720, Cl. 560-9.000.
Ono, Tetsuji: *See—*
Yamauchi, Shin; Yonehara, Kiyoshi; Horie, Koshi; Ono, Tetsuji; and Ohara, Takashi, 4,128,503, Cl. 252-435.000.
Onoki, Fumio; and Kamiya, Hajime, to Kabushiki Kaisha Hoya Lens. Anti reflection coating with a composite middle layer. 4,128,303, Cl. 350-164.000.
Orban, Jean: *See—*
Vital, Zoltan; and Orban, Jean, 4,128,786, Cl. 315-151.000.
Oren, Jess W., III; Kirchner, Eugene M.; and Wehry, Charles F., Jr., to Armstrong Cork Company. Solar energy collector. 4,128,095, Cl. 126-270.000.
Ormesher, Robert J.: *See—*
van Linden, Jan H. L.; Claxton, Raymond J.; Herrick, Joseph R.; and Ormesher, Robert J., 4,128,415, Cl. 75-65.00R.
Osato, Akira: *See—*
Nagano, Akira; Urasaki, Kazuaki; Osato, Akira; and Sakurai, Isao, 4,128,756, Cl. 235-92.0SB.
Otis Engineering Corporation: *See—*
Taylor, Donald F., 4,128,127, Cl. 166-105.000.
Otsu, Shinpei; Sekiguchi, Akira; Tobita, Nobuyoshi; Chikamatsu, Shigeru; Hosoe, Yoshihisa; Matsui, Motoaki; Sugimoto, Noboru; and Totsuka, Noriyoshi, to Hitachi, Ltd. Equipment for producing high voltage rectifying units. 4,128,378, Cl. 425-445.000.
Owen, Daniel V., to General Electric Company. Method of operating gaseous discharge lamps. 4,128,789, Cl. 315-209.00R.
Owens-Corning Fiberglas Corporation: *See—*
McCluskey, John J., 4,128,601, Cl. 260-862.000.
Owens-Illinois, Inc.: *See—*
Miller, John W. V., 4,128,901, Cl. 365-116.000.
Oy Wartsila AB: *See—*
Komulainen, Pekka, 4,128,213, Cl. 242-66.000.

Malminen, Henrikki; and Martikainen, Kaarlo, 4,127,996, Cl. 70-365.000.

Oyaide, Sadamu: *See—*
Ogura, Hajime; Asakawa, Haruma; Kondoh, Junichi; Nakamura, Masashi; and Oyaide, Sadamu, 4,128,068, Cl. 114-26.000.

Oyamada, Takeo; Tomizawa, Choji; Domoto, Masahiro; and Narisawa, Shizuo, to Sumitomo Chemical Company, Limited. Pressure-sensitive adhesive and vinyl acetate-ethylene copolymer emulsion useful as base material therefor. 4,128,518, Cl. 260-29.6WB.

Ozerova, Alexandra P.: *See—*
Terekhov, Kuzma I.; Tumanov, Alexei T.; Ozerova, Alexandra P.; Topilin, Valentin V.; Dzugutov, Mikhail Y.; Ljubinskaya, Mara A.; Pashchnik, Gennady A.; Nikishov, Alexandr S.; and Ustinov, Terenty I., 4,128,419, Cl. 75-171.000.

Ozolins, Janis: *See—*
Haberl, John B.; and Ozolins, Janis, 4,128,335, Cl. 356-37.000.

Pabst Brewing Company: *See—*
Naylor, Robert; and Coyer, Howard F., 4,128,637, Cl. 424-95.000.

Pacht, Amos; and Johnson, Herbert L. Fluid delivery system. 4,128,207, Cl. 239-186.000.

Page, Jerome M., to Rockwell International Corporation. Prediction computation for weapon control. 4,128,837, Cl. 343-7.00G.

Paitula, Hannu O., to Granges Essem Aktiebolag Fack. Locking device for vehicle safety seat belts. 4,128,261, Cl. 280-744.000.

Pako Corporation: *See—*
Melander, Theodore A.; and Charnley, Ralph L., 4,128,325, Cl. 354-298.000.
Strunc, Gerald R.; and Laciak, Francis M., 4,128,887, Cl. 364-475.000.

Palitex Project Company GmbH: *See—*
Munker, Gert, 4,127,983, Cl. 57-279.000.

Palleduhn, Dieter: *See—*
Krueger, Friedrich; and Palleduhn, Dieter, 4,128,492, Cl. 252-180.000.

Palmer, Clifford A., to Holset Engineering Company Limited. Bearing retaining plate. 4,128,283, Cl. 308-237.00R.

Palmer, David N.; and Davison, John E., to Combustion Engineering, Inc. Lubricant for high temperature nuclear service. 4,128,486, Cl. 252-25.000.

Palyn Associates, Inc.: *See—*
Domenico, Robert J., 4,128,771, Cl. 307-52.000.

Panafacom Limited: *See—*
Yamamoto, Mitsuru; Arai, Jun; Isogawa, Takao; and Hasebe, Isamu, 4,128,881, Cl. 364-200.000.

Pantukh, Boris I.: *See—*
Liakumovich, Alexandr G.; Pantukh, Boris I.; Sultanova, Mengzda K.; Popov, Vasily P.; Tolstikov, Genrikh A.; Monakov, Jury B.; Juriev, Valery P.; Mandelshtam, Elena Y.; Korotkevich, Boris S.; and Shmuk, Jury A., 4,128,708, Cl. 526-162.000.

Paoli, Alfred, to Akzona Incorporated. Conductive strip. 4,128,293, Cl. 339-258.00R.

Papst, Georg; and Wrobel, Guenter, to Papst-Motoren KG. Radial flow fan with motor cooling and resilient support of rotor shaft. 4,128,364, Cl. 417-354.000.

Papst, Georg F.: *See—*
Merkle, Alfred; and Papst, Georg F., 4,128,778, Cl. 310-67.00R.

Papst-Motoren KG: *See—*
Merkle, Alfred; and Papst, Georg F., 4,128,778, Cl. 310-67.00R.
Papst, Georg; and Wrobel, Guenter, 4,128,364, Cl. 417-354.000.

Paraskos, John A.: *See—*
Malone, Huey P.; Paraskos, John A.; and Taylor, Herman, Jr., 4,128,471, Cl. 208-8.000.

Parcor: *See—*
Braye, Emile, 4,128,561, Cl. 260-329.0AM.

Parke, Davis & Company: *See—*
Rebstock, Mildred C.; Nicolaides, Ernest D.; Mick, Thomas F.; Tinney, Francis J.; and Wittle, Eugene L., 4,128,540, Cl. 260-112.50R.

Parker, Bill B.; Beynand, Rudy; and Cormier, Arthur J., to American International Tool Company, Inc. Mud retaining valve. 4,128,108, Cl. 137-327.000.

Parks, Harold G.: *See—*
Norton, James F.; Parks, Harold G.; and Possin, George E., 4,128,897, Cl. 365-118.000.

Parrish, Charles A.; and Webb, Bryant F., to Sperry Rand Corporation. Drive means for a crop harvesting machine. 4,127,981, Cl. 56-14.400.

Pasedach, Heinrich: *See—*
Arnold, Lothar; Pasedach, Heinrich; and Pommer, Horst, 4,128,728, Cl. 568-799.000.

Pashchnik, Gennady A.: *See—*
Terekhov, Kuzma I.; Tumanov, Alexei T.; Ozerova, Alexandra P.; Topilin, Valentin V.; Dzugutov, Mikhail Y.; Ljubinskaya, Mara A.; Pashchnik, Gennady A.; Nikishov, Alexandr S.; and Ustinov, Terenty I., 4,128,419, Cl. 75-171.000.

Pasquinelli, Aldo: *See—*
Barba, Diego; D'Agostini, Candido; and Pasquinelli, Aldo, 4,128,457, Cl. 203-29.000.

Pastor, Ricardo C.; and Robinson, Morton, to Hughes Aircraft Company. Generation of CF_4 from Teflon for reactive atmosphere processing and growth of metal fluorides. 4,128,589, Cl. 260-653.000.

Pataki, William V. Apparatus for feeding and orienting parts. 4,128,159, Cl. 198-389.000.

Pavlis, James D., to United States of America, Army. Phase discriminator. 4,128,812, Cl. 328-134.000.

Pawlak, Daniel E.; and Levenson, Michael. Deflagrating propellant compositions. 4,128,443, Cl. 149-71.000.

Pay Television Corporation: *See—*
Urwin, Peter T., 4,128,038, Cl. 85-45.000.

Payne, George C., to PNI, Inc. Metal detector system with ground effect rejection. 4,128,803, Cl. 324-3.000.

Peacock, Frederick C.: *See—*
Hunt, John D.; and Peacock, Frederick C., 4,128,665, Cl. 424-330.000.

Peemoller, Horst: *See—*
Flisikowski, Peter; and Peemoller, Horst, 4,128,781, Cl. 313-60.000.

Pelengaris, Akis. Illuminated shoe. 4,128,861, Cl. 362-103.000.

Peloggio, Alessandro. Apparatus for sewing together portions of knitted articles. 4,128,066, Cl. 112-27.000.

Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 1-Methyl-4-piperidyl 5-phenyl-2-furoates. 4,128,550, Cl. 546-214.000.

Pelousek, Herbert: *See—*
Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, 4,128,533, Cl. 528-279.000.
Kohler, Armin; Pelousek, Herbert; Ohse, Helmut; Westermann, Hans; and Magosch, Karl-Heinz, 4,128,534, Cl. 528-279.000.

Pemsler, J. Paul: *See—*
Rappas, Alkis S.; and Pemsler, J. Paul, 4,128,416, Cl. 75-119.000.

Pendleton, Robert G.: *See—*
Bondinell, William E.; and Pendleton, Robert G., 4,128,666, Cl. 424-330.000.

Pennsylvania Engineering Corporation: *See—*
Nagati, Rashed N., 4,128,232, Cl. 266-241.000.

Pennwalt Corporation: *See—*
Bartoszek, Edward J.; and Christofas, Alkis, 4,128,519, Cl. 260-29.6NR.
Kydonieus, Nicholas, 4,128,517, Cl. 260-29.60F.
Merchant, Dihrendra R., 4,128,626, Cl. 423-488.000.

Penrod, Orville R.: *See—*
Bartley, John E.; Penrod, Orville R.; and Radosevich, Lawrence D., 4,127,934, Cl. 29-626.000.

Penrose, Alexander B.; and Leeming, Michael R. G., to Pfizer Inc. Triazapentadienes as acaricides. 4,128,652, Cl. 424-263.000.

Periphonics Corporation: *See—*
Ragland, Evan L., III, 4,128,346, Cl. 400-144.200.

Perkin-Elmer Corporation, The: *See—*
Newell, William H., 4,128,352, Cl. 403-57.000.

Perronnet, Jacques; and Taliani, Laurent, to Roussel Uclaf. Novel 3-(phosphoryloxy) and (phosphonyloxy)-thiophenes. 4,128,562, Cl. 260-332.30R.

Perry, Joseph A. Pressure transducer. 4,128,013, Cl. 73-701.000.

Pertl, Jerry H.; and Koehler, Howard A., to Sperry Rand Corporation. Method and apparatus for preventing erroneous data transfer from a digital computer. 4,128,874, Cl. 364-200.000.

Pestolite Inc.: *See—*
Phillips, Dennis G., 4,127,961, Cl. 43-139.000.

Peters, Dudley C.: *See—*
Scott, John P.; Peters, Dudley C.; and Foster, Richard C., 4,128,800, Cl. 322-28.000.

Peters, John; and Thompson, Edward E. Mouse trap. 4,127,958, Cl. 43-81.000.

Petersen, Egon N.: *See—*
Vollkommer, Norbert; Petersen, Egon N.; Klinkenberg, Herbert; and Schmidt, Werner, 4,128,709, Cl. 526-218.000.

Peterson, Janet B.: *See—*
Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, 4,128,718, Cl. 548-313.000.

Peterson, Maurice W., Jr., to Square D Company. Polyphase circuit breaker having improved trip crossbar assembly. 4,128,822, Cl. 335-8.000.

Peterson, Richard J., Jr. Fuse adapter terminal. 4,128,291, Cl. 339-154.00A.

Petillo, Phillip J. Tailpiece. 4,128,033, Cl. 84-299.000.

Petry, Stanton H., to Cory Food Services, Inc. Beverage brewer structure. 4,128,050, Cl. 99-304.000.

Petterson, Leif E.: *See—*
Petterson, Leif J.; and Petterson, Leif E., 4,128,143, Cl. 187-29.00R.

Petterson, Leif J.; and Petterson, Leif E. Supervisory control means for automatic elevator systems. 4,128,143, Cl. 187-29.00R.

Pfizer Inc.: *See—*
Penrose, Alexander B.; and Leeming, Michael R. G., 4,128,652, Cl. 424-263.000.

Pfluger, Eberhard: *See—*
Gansert, Willi; Bergfried, Dietrich; Heinrich, Gert; Schnepf, Dietmar; Slansky, Harry; Pfluger, Eberhard; and Dorkel, Jean, 4,128,802, Cl. 322-28.000.

Pforzheimer Uhren-Rohwerke Rudolf Wehner: *See—*
Murrle, Kurt, 4,127,985, Cl. 58-58.000.

Phillips, Benjamin A., to Allied Chemical Corporation. Method and generator unit of an absorption heat pump system for separating a rich liquor into a refrigerant and a solution low in refrigerant content. 4,127,993, Cl. 62-101.000.

Phillips, Dennis G., to Pestolite Inc. Apparatus for entrapping insects. 4,127,961, Cl. 43-139.000.

Phillips Petroleum Company: *See—*
Montgomery, Dean P., 4,128,595, Cl. 260-677.00H.
Smith, Clifford E.; and Holtz, Hans D., 4,128,596, Cl. 260-683.530.

Pickrell, John W. Trash collecting and handling vehicle. 4,128,182, Cl. 214-302.000.

Pierret, James A.: *See—*
Marsh, Harold G.; and Pierret, James A., 4,128,421, Cl. 75-251.000.

Pillsbury Company, The: *See—*
Rejsa, Jack J., 4,128,074, Cl. 118-24.000.

Pizzo, Frank, to C. J. Hendry Company. Inflatable raft construction and method. 4,127,909, Cl. 9-11.00A.

Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., to Mobil Oil Corporation. Stabilized zinc-containing zeolites. 4,128,504, Cl. 252-455.00Z.

Plascon AG.: *See—*
Badertscher, Hans; and Schindler, Walter, 4,128,307, Cl. 350-265.000.

Pluschkell, Wolfgang: *See—*
Hater, Martin; Pluschkell, Wolfgang; and Wisnewski, Heinrich, 4,128,414, Cl. 75-58.000.

PMS Consolidated: *See—*
Bradbury, William B.; Watts, Robert H.; and Scott, E. Timm, 4,128,211, Cl. 241-101.600.

Pneumatic Force Feeder, Inc.: *See—*
Stamatiou, Dimitri S.; and Stamatiou, Lila D., 4,128,404, Cl. 55-1.000.

Pneutek, Inc.: *See—*
Haytayan, Harry M., 4,128,110, Cl. 137-454.200.

PNI, Inc.: *See—*
Payne, George C., 4,128,803, Cl. 324-3.000.

Pohio, James N.; Richards, Douglas E.; Robertson, Angus A. J.; Williams, William; and Garnett, Kenneth J. Pelting of animals. 4,127,917, Cl. 17-21.000.

Pohland, Alois, to Carl Freudenberg, Firma. Soft, non-woven fabrics and process for their manufacture. 4,128,679, Cl. 428-131.000.

Pohlig, Winfried, to U.S. Philips Corporation. Method of direction finding and direction indication of railbound vehicles. 4,128,218, Cl. 246-247.000.

Polak's Frutal Works, Inc.: *See—*
Mitzner, Bernard M., 4,128,507, Cl. 252-522.000.

Polaroid Corporation: *See—*
Greenwald, Richard B., 4,128,425, Cl. 96-66.0HD.
Timson, William J., 4,128,667, Cl. 427-348.000.

Polaschegg, Hans-Dietrich, to Leybold-Heraeus GmbH & Co. KG. Energy analyzer for charged particles. 4,128,763, Cl. 250-305.000.

Polinski, Leon M.: *See—*
Carr, William C.; Polinski, Leon M.; Hindin, Saul G.; and Kosco, James L., 4,128,591, Cl. 260-668.00A.

Pollack, James W.: *See—*
Zanoni, Louis A.; and Pollack, James W., 4,128,003, Cl. 73-6.000.

Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Dehydrogenation method. 4,128,590, Cl. 260-666.00A.

Pommer, Horst: *See—*
Arnold, Lothar; Pasedach, Heinrich; and Pommer, Horst, 4,128,728, Cl. 568-799.000.

Poncet, Jean-Claude: *See—*
Caron, Jacques; Poncet, Jean-Claude; and Varney, Bernard, 4,128,004, Cl. 73-38.000.

Pond, David M.; and Wang, Richard H., to Eastman Kodak Company. Benzotriazole ortho-ester compounds useful as ultraviolet stabilizers. 4,128,559, Cl. 260-308.00B.

Poole, Walter D. Air filter for motor vehicle carburetor. 4,128,408, Cl. 55-498.000.

Popkin, Jerome L.; and Litwitz, Edward F., to York Luggage Corporation. Expansible carrying case. 4,128,150, Cl. 190-44.000.

Popov, Vasily P.: *See—*
Liakumovich, Alexandr G.; Pantukh, Boris I.; Sultanova, Mengzda K.; Popov, Vasily P.; Tolstikov, Genrikh A.; Monakov, Jury B.; Juriev, Valery P.; Mandelshtam, Elena Y.; Korotkevich, Boris S.; and Shmuk, Jury A., 4,128,708, Cl. 526-162.000.

Possin, George E.: *See—*
Norton, James F.; Parks, Harold G.; and Possin, George E., 4,128,897, Cl. 365-118.000.

Post Office, The: *See—*
Riches, Stanley J. W., 4,128,140, Cl. 184-1.500.

Powell, George A. Skateboard wheels. 4,128,254, Cl. 280-87.04A.

Powell, Justin C.; and McMahon, Matthew A., to Texaco Inc. Cellular solvent refined coal and methods for making same. 4,128,401, Cl. 44-1.00R.

Powers, Richard J. Pallet and roller post construction therefor. 4,128,253, Cl. 280-79.10A.

PPG Industries, Inc.: *See—*
Bitterice, Michael G.; and Keslar, Leroy D., 4,128,448, Cl. 156-166.000.

Pratt-Read Corporation: *See—*
Elkins, Vance V., Jr., 4,128,242, Cl. 273-77.00A.

Premetz, Michael J., to Premetz, Michael J. Stowable decorative lights. 4,128,863, Cl. 362-249.000.

Price, Barry J.; Clitherow, John W.; and Bradshaw, John, to Allen & Hanburys Limited. Aminoalkyl furan derivatives. 4,128,658, Cl. 424-285.000.

Price, Michael G.: *See—*
Brooker, Gary L.; Terasaki, Wesley L.; and Price, Michael G., 4,128,628, Cl. 424-1.000.

Prioste, Jerry E., to Motorola, Inc. High speed data shifter array. 4,128,872, Cl. 364-900.000.

Procter & Gamble Company, The: *See—*
Barford, Brian D.; and Benjamin, Lawrence, 4,128,484, Cl. 252-8.800.

Produits Chimiques Ugine Kuhlmann: *See—*
Schirmann, Jean-Pierre; Dubreux, Bernard; Bakes, Michel; Delavarenne, Serge-Yvon; and Daude-Lagrave, Marie-Christine, 4,128,494, Cl. 252-186.000.

Pross, Wilhelm: *See—*
Muhlbock, Franz; Karpaty, Akos; and Pross, Wilhelm, 4,128,400, Cl. 422-101.000.

Prusoff, William H.: *See—*
Lin, Tai-Shun; Fischer, Paul H.; Prusoff, William H.; and Shiau, George T., 4,128,639, Cl. 424-180.000.

Pulejo, Salvatore. Magic square puzzle. 4,128,243, Cl. 273-156.000.

Purtschert, Werner, to Sulzer Brothers Limited. Self-pressurizing floating gas bearing having a magnetic bearing therein. 4,128,280, Cl. 308-9.000.

Pusch, Walter G., to Johns-Manville Corporation. High density asbestos-free tobermorite thermal insulation containing wollastonite. 4,128,434, Cl. 106-120.000.

PYROHM, INC.: *See—*
Scherba, Michael B., 4,128,818, Cl. 333-70.00S.

Quehen, Andre, to SECIM. Rolling mill stand. 4,127,997, Cl. 72-19.000.

Radosevich, Lawrence D.: *See—*
Bartley, John E.; Penrod, Orville R.; and Radosevich, Lawrence D., 4,127,934, Cl. 29-626.000.

Radovich, David A.: *See—*
Spitler, Keith G.; and Radovich, David A., 4,128,512, Cl. 521-55.000.

Ragland, Evan L., III, to Periphonics Corporation. Daisy type print wheel apparatus. 4,128,346, Cl. 400-144.200.

Ramos, Edward; and Cuneo, Joseph V., to United States of America, Army. Time delay computer for ordnance fuse. 4,128,836, Cl. 343-7.0PF.

Rana, Victor F.; and Siniscal, Paul D., to Rockwell International Corporation. Cart conveyor system. 4,128,163, Cl. 198-796.000.

Randam Electronics, Inc.: *See—*
Stevens, William M., 4,128,766, Cl. 250-483.000.

Raniero, John J. Foldable suitcase dolly. 4,128,252, Cl. 280-40.000.

Rank Xerox Limited: *See—*
Sugiyama, Mitsuhiko; and Shinkai, Michio, 4,128,327, Cl. 355-3.00R.

Rappas, Aikis S.; and Pemsler, J. Paul, to Kennecott Copper Corporation. Nickel recovery employing carbonyl ferrates. 4,128,416, Cl. 75-119.000.

Ratcliffe, Charles T., to Allied Chemical Corporation. Catalytic reduction of aromatic sulfonyl halides with hydrogen sulfide to yield aromatic thiols. 4,128,586, Cl. 260-609.00D.

Rathjen, Edwin H., Jr., to United States of America, Army. Arc spray welding replaceable electrode tip. 4,128,754, Cl. 219-137.00R.

Rawson, Francis F. H., to USM Corporation. Method of attaching heels to shoes. 4,128,609, Cl. 264-23.000.

Rayburn, Billy R.; and Hayes, Alfred F., to Mu, Paul T., a part interest. Ignition device. 4,128,387, Cl. 431-78.000.

Rayburn, Charles C., to Illinois Tool Works Inc. Pleated metallized film capacitor wound about its center. 4,128,857, Cl. 361-309.000.

RCA Corporation: *See—*
Allen, James A.; and Coleman, Clyde F., 4,128,247, Cl. 274-23.00R.
Anderson, Charles H., 4,128,784, Cl. 313-422.000.
Gamble, Edward B., 4,128,868, Cl. 363-26.000.
Katagi, Kazuo, 4,128,834, Cl. 343-5.0EM.
Mirsch, John W., 4,128,824, Cl. 335-213.000.

Rebstock, Mildred C.; Nicolaides, Ernest D.; Mick, Thomas F.; Tinney, Francis J.; and Wittle, Eugene L., to Parke, Davis & Company. Pyroglutamyl-histidyl-tryptophanyl-seryl-tyrosyl hydrazides. 4,128,540, Cl. 260-112.50R.

Recognition Equipment Incorporated: *See—*
McMillan, Robert M., 4,128,298, Cl. 350-96.100.

Regan, A. Michael, to Regan Offshore International, Inc. Apparatus for leveling and supporting a sub-sea drilling template. 4,127,991, Cl. 405-202.000.

Regan Offshore International, Inc.: *See—*
Regan, A. Michael, 4,127,991, Cl. 405-202.000.

Rehag, Klaus: *See—*
Meurer, Hans; and Rehag, Klaus, 4,127,998, Cl. 72-97.000.

Reich, Manfred, to Chemische Werke Huels Aktiengesellschaft. Catalytic splitting of formic acid esters on hydrogenation catalysts. 4,128,730, Cl. 568-914.000.

Reichert, Wolfgang, to Krause, Walter. Suspended flexible container. 4,127,970, Cl. 52-63.000.

Reid, Albert R., to Hercules Incorporated. Superabsorbent cellulosic fibers having a coating of a water insoluble, water absorbent polymer and method of making the same. 4,128,692, Cl. 428-378.000.

Reimoser, Fritz. Means for marking of points within the terrain. 4,127,972, Cl. 52-103.000.

Reinhardt, Victor S.: *See—*
United States of America, National Aeronautics and Space Administration; Reinhardt, Victor S.; and Cervenka, Peter O., 4,128,814, Cl. 331-94.000.

Reinke Manufacturing Company: *See—*
Coash, Ronald J., 4,128,205, Cl. 239-1.000.

Reisfeld, Renata; Eckstein, Yona; and Boehm, Leah, to United States of America, Army. Glass compositions having fluorescence properties. 4,128,411, Cl. 65-18.000.

Rejsa, Jack J., to Pillsbury Company, The. Apparatus for coating food products. 4,128,074, Cl. 118-24.000.

Relhor S.A.: *See—*
Bechtiger, Charles G., 4,128,237, Cl. 271-241.000.

Reliable Electric Company: *See—*
Gilberts, Alexander G., 4,128,855, Cl. 361-119.000.

Reliance Electric Company: *See—*
Suggs, Robert, 4,128,671, Cl. 427-125.000.

Renk, Paul, to Barmag Barmer Maschinenfabrik AG. Mixing apparatus. 4,128,342, Cl. 366-99.000.

Renken, Albert: *See—*
Leupold, Ernst I.; Arpe, Hans-Jurgen; Renken, Albert; and Schlosser, Ernst-Gunther, 4,128,727, Cl. 560-247.000.

Rensch, Adam; and Albert, Otto, to BASF Aktiengesellschaft. Device for the continuous monitoring of oil leaks on oxygen compressors. 4,128,831, Cl. 340-605.000.

Rentokil Limited: *See—*
Lynch, David J., 4,128,397, Cl. 422-29.000.

Research Corporation: *See—*
Lin, Tai-Shun; Fischer, Paul H.; Prusoff, William H.; and Shiau, George T., 4,128,639, Cl. 424-180.000.

Rhee, Dennis W., to Admiral Corporation. Selectively coupled synthesizer for tuner of TV receiver. 4,128,849, Cl. 358-191.000.

Rhodes, Sammy J.: *See—*
Coleman, Donald F.; and Rhodes, Sammy J., 4,128,827, Cl. 340-52.00R.

Rhodes, William E., III: *See—*
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,128,662, Cl. 424-319.000.

Rhone-Poulenc Industries: *See—*
Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,128,650, Cl. 424-258.000.

Rhythm Watch Co., Ltd.: *See—*
Nozawa, Kazutoshi; Ashibe, Yasue; Aruga, Hatsuo; and Tatsuzawa, Kunio, 4,127,986, Cl. 58-134.000.

Rich, Leo G.: *See—*
Arnston, Robert W.; Trussell, Gerald C.; and Rich, Leo G., 4,128,005, Cl. 73-117.300.

Richard Wolf GmbH: *See—*
Bauer, Siegfried, 4,128,099, Cl. 128-303.170.

Richards, Douglas E.: *See—*
Pohio, James N.; Richards, Douglas E.; Robertson, Angus A. J.; Williams, William; and Garnett, Kenneth J., 4,127,917, Cl. 17-21.000.

Richards, William W.: *See—*
Johnson, Herbert E.; and Richards, William W., 4,128,452, Cl. 156-584.000.

Riches, Stanley J. W., to Post Office, The. Apparatus for recycling engine lubricating oil. 4,128,140, Cl. 184-1.500.

Richwine, John R., to Hercules Incorporated. Vulcanizing halogen-containing polymers. 4,128,510, Cl. 528-36.000.

Ricoh Company, Ltd.: *See—*
Kawano, Haruyoshi, 4,128,329, Cl. 355-14.000.
Suzuki, Minoru, 4,128,079, Cl. 118-658.000.
Yanagawa, Nobuyuki; and Tagawa, Kazuaki, 4,128,334, Cl. 355-75.000.

Ried, Walter: *See—*
Merkel, Wulf; Alpermann, Hans G.; Geisen, Karl; Kothe, Norbert; and Ried, Walter, 4,128,643, Cl. 424-251.000.

Riemath, Heinz: *See—*
Loch, Friedhelm H.; Mailander, Hans; Riemath, Heinz; Schmid, Richard; and Stickel, Ernst, 4,128,287, Cl. 312-253.000.

Riester, William C.: *See—*
Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., 4,127,912, Cl. 15-250.420.

Rietmuller, Karl-Heinz, to VDO Adolf Schindling AG. Illumination device for indicator instruments. 4,128,859, Cl. 362-26.000.

Riker Laboratories, Inc.: *See—*
Moore, George G. I., 4,128,664, Cl. 424-324.000.
Scherrer, Robert A.; and Stern, Richard M., 4,128,659, Cl. 424-285.000.

Rilling, Victor R.: *See—*
Britton, James E.; Metcalf, Fredric D.; Sommer, John G.; Kuan, Tiong H.; Rilling, Victor R.; and Welch, John A., 4,128,523, Cl. 260-33.6AQ.

Rimmelzwaan, Franciscus J.: *See—*
Fransen, Jan J. B.; and Rimmelzwaan, Franciscus J., 4,128,782, Cl. 313-174.000.

Ringrose, Peter S.: *See—*
Atherton, Frank R.; Hall, Michael J.; Hassall, Cedric H.; Lambert, Robert W.; and Ringrose, Peter S., 4,128,542, Cl. 260-112.50R.

Riso Kagaku Corporation: *See—*
Hayama, Noboru; and Tsuji, Yoshio, 4,128,057, Cl. 101-128.200.

Ritter, Arthur J., to Caterpillar Tractor Co. Rotatable shaft coupling. 4,128,022, Cl. 74-694.000.

Rittmannsberger, Norbert: *See—*
Gansert, Willi; and Rittmannsberger, Norbert, 4,128,801, Cl. 322-28.000.

Roach, Mark E.: *See—*
Nutt, Wendell G.; and Roach, Mark E., 4,128,736, Cl. 174-112.000.

Robert Bosch GmbH: *See—*
Esper, Friedrich J.; and Zeller, Robert, 4,128,420, Cl. 75-230.000.
Gansert, Willi; and Rittmannsberger, Norbert, 4,128,801, Cl. 322-28.000.
Gansert, Willi; Bergfried, Dietrich; Heinrich, Gert; Schnepf, Dietmar; Slansky, Harry; Pfluger, Eberhard; and Dorkel, Jean, 4,128,802, Cl. 322-28.000.
Illenberger, Arno; Ruprecht, Gert; and Berger, Klaus, 4,128,844, Cl. 357-31.000.
Kemmner, Ulrich; and Ruhl, Karl, 4,128,365, Cl. 417-423.00R.
Morishima, Toshio, 4,128,799, Cl. 322-28.000.

Robert J. McNair, Jr.: *See—*
Hertkorn, Douglas J., 4,127,956, Cl. 43-19.000.

Roberts, Leslie N., to Buckeye International, Inc. Center brace member. 4,128,062, Cl. 105-420.000.

Robertson, Angus A. J.: *See—*
Pohio, James N.; Richards, Douglas E.; Robertson, Angus A. J.; Williams, William; and Garnett, Kenneth J., 4,127,917, Cl. 17-21.000.

Robinson, Ernest G., Jr., to Kracker, Denis J. Production of modulation signals from audio frequency sources to control color contributions to visual displays. 4,128,846, Cl. 358-82.000.

Robinson, Morton: *See—*
Pastor, Ricardo C.; and Robinson, Morton, 4,128,589, Cl. 260-653.000.

Robinson, Victor S.; and Eshelman, Donald M., to New Jersey Zinc Company, The. Process for desulfurization using particulate zinc oxide shapes of high surface area and improved strength. 4,128,619, Cl. 423-244.000.

Roccaforte, Harry I., to Champion International Corporation. Display carton with retaining panels. 4,128,168, Cl. 206-45.140.

Rochelle, William R.: *See—*
Tillinghast, William S.; and Rochelle, William R., 4,127,950, Cl. 37-62.000.

Rock, John V., to Spectra-Physics, Inc. Carrier composition control for liquid chromatographic systems. 4,128,476, Cl. 210-31.00C.

Rockwell International Corporation: *See—*
Chen, Thomas T., 4,128,894, Cl. 365-4.000.
George, Peter K.; Gergis, Isoris S.; and Kobayashi, Tsutomu, 4,128,896, Cl. 365-12.000.
Page, Jerome M., 4,128,837, Cl. 343-7.00G.
Rana, Victor F.; and Siniscal, Paul D., 4,128,163, Cl. 198-796.000.

Roehn, Herbert F., to SMW Packaging Corporation. Carton handling and erecting machine. 4,127,977, Cl. 53-565.000.

Rogier, Edgar R.: *See—*
MacKay, Kenneth D.; and Rogier, Edgar R., 4,128,493, Cl. 252-184.000.

Rohr, Franz-Josef; and Krapf, Rudolf, to Brown, Boveri & Cie AG. Electrochemical sensor. 4,128,469, Cl. 204-195.00S.

Rohringer, Peter: *See—*
Nachbur, Hermann; Hiestand, Armin; and Rohringer, Peter, 4,128,687, Cl. 428-253.000.

Rojo, Agustin, Jr. Building constructed of precast L-shaped concrete units. 4,127,971, Cl. 52-79.110.

Rollo, Randall W.: *See—*
Metcalfe, Paul E.; Rollo, Randall W.; and Stagg, Malcolm J., 4,128,678, Cl. 428-119.000.

Rompeltien, Rainer: *See—*
Geschonke, Hans; Rompeltien, Rainer; and Rummel, Wolfgang, 4,128,516, Cl. 260-29.60R.

Rork, Marjorie A. Method and article treating pictures. 4,128,447, Cl. 156-155.000.

Rose, Larry E.; and Lawrence, Norman F., to General Foods Corporation. Extrusion shaping apparatus. 4,128,372, Cl. 425-311.000.

Rosell, Jorge E., to Bendiberica, S. A. Power steering mechanism. 4,128,046, Cl. 91-375.00A.

Rosinski, Edward J.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,128,504, Cl. 252-455.00Z.

Ross, Mervin L.; and Gittins, Marvin W. Extension light assembly. 4,128,226, Cl. 362-378.000.

Ross, Milton I. Method of assembling electrical connectors. 4,127,924, Cl. 29-413.000.

Rossler, Erich; Deiner, Hans; Sandner, Bernhard; and Schilling, Hans, to Ciba-Geigy Corporation. Process for treating textiles with reactive polymers. 4,128,675, Cl. 427-390.00E.

Rossler, Frederick W., Jr.: *See—*
Lauterbach, John H.; and Rossler, Frederick W., Jr., 4,128,296, Cl. 339-274.000.

Rossmann, George L. Water sports craft. 4,128,073, Cl. 115-22.000.

Roth, Roy W., to American Cyanamid Company. Making absorbable surgical felt. 4,128,612, Cl. 264-126.000.

Rothbuhr, Lothar: *See—*
Wolff, Siegfried; and Rothbuhr, Lothar, 4,128,438, Cl. 106-307.000.

Rothgordt, Ulf; Hinz, HansDieter; and Verspui, Gerrit, to U.S. Philips Corporation. Electrostatic printing device with monocrystalline stylus. 4,128,842, Cl. 346-155.000.

Roullet, Gerald; and Bortuzzo, Jean-Pierre, to Thomson-Brandt. Optical reading device comprising a focussing detection device. 4,128,847, Cl. 358-128.000.

Roullet, Gerald: *See—*
Lehureau, Jean-Claude; Malissin, Roland; and Roullet, Gerald, 4,128,309, Cl. 350-295.000.

Roussel Uclaf: *See—*
Martel, Jacques; and Tessier, Jean, 4,128,584, Cl. 260-586.00R.
Perronnet, Jacques; and Taliani, Laurent, 4,128,562, Cl. 260-332.30R.

Rovnyak, George C., to E. R. Squibb & Sons, Inc. Substituted thiazolo [3,2-a]-thiopyrano[4,3-d]pyrimidines. 4,128,647, Cl. 424-251.000.

Rovnyak, George C., to E. R. Squibb & Sons, Inc. Substituted pyrano[4,3-d]-thiazolo[3,2-a]pyrimidines. 4,128,648, Cl. 424-251.000.

Rowe, Stephen H., to Xerox Corporation. Illuminator. 4,128,332, Cl. 355-67.000.

Rudolph, Frank W.: *See—*
Mead, Ralph T.; Greatbatch, Wilson; Rudolph, Frank W.; and Frenz, Norbert W., Jr., 4,128,703, Cl. 429-101.000.

Rudolph, Karl-Heinz: *See—*
Buchner, Werner; Degen, Bruno; Fries, Ludwig; Helmut, Judat; Mundil, Rudolf; and Rudolph, Karl-Heinz, 4,128,568, Cl. 260-448.20E.

Ruhl, Karl: *See—*
Kemmner, Ulrich; and Ruhl, Karl, 4,128,365, Cl. 417-423.00R.

Ruminsky, Robert T., to Honeywell Inc. Compressor minimum off-time system. 4,128,854, Cl. 361-22.000.

Rummel, Wolfgang: *See—*
Geschonke, Hans; Rompeltien, Rainer; and Rummel, Wolfgang, 4,128,516, Cl. 260-29.60R.

Runkle, Dean E.: *See—*
Brown, Arthur K.; and Runkle, Dean E., 4,128,112, Cl. 137-544.000.

Ruprecht, Gert: *See—*
Illenberger, Arno; Ruprecht, Gert; and Berger, Klaus, 4,128,844, Cl. 357-31.000.

Russell, Barbara P., heir: *See—*
Terry, James A., deceased; Russell, Barbara P., heir; Terry, James F., heir; and Cain, Shirley A., heir, 4,128,117, Cl. 144-3.00K.

Russell, James L., to Arinc Research Corporation. Method and apparatus for measuring distance between an aircraft and a ground station. 4,128,835, Cl. 343-6.5LC.

Russell, Ronald R., to General Electric Company. Ground fault defeat cable for high current static trip circuit breaker test sets. 4,128,804, Cl. 324-28.0CB.

Ryan, Edward W.; and Israel, George H., Jr., to General Electric Company. Exhaust nozzle flap seal arrangement. 4,128,208, Cl. 239-265.390.

S & W Sales, Inc.: *See—*
Sabrowsky, Gerald; and Walker, Chancy M., 4,127,949, Cl. 37-13.000.

Saarbergwerke Aktiengesellschaft: *See—*
Leibrock, Kurt; Bier, Adolf; and Buch, Friedrich, 4,128,402, Cl. 44-11.000.

Sabourin, Edward T.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for the preparation of nitrophenyl hydroxy substituted acetylene and conversion to nitrophenylacetylene. 4,128,588, Cl. 260-645.000.

Sabrowsky, Gerald; and Walker, Chancy M., to S & W Sales, Inc. Snowmobile trail groomer. 4,127,949, Cl. 37-13.000.

Sagami Chemical Research Center: *See—*
Kojima, Takakazu; and Ohtsuka, Yozo, 4,128,719, Cl. 548-321.000.

Saito, Hiromasa: *See—*
Hayashi, Katsutake; Saitoh, Tutomu; Yomogida, Katsuyuki; and Saito, Hiromasa, 4,128,630, Cl. 424-69.000.

Saito, Seiki: *See—*
Yasuhara, Hiroshi; and Saito, Seiki, 4,128,878, Cl. 364-200.000.

Saitoh, Tutomu: *See—*
Hayashi, Katsutake; Saitoh, Tutomu; Yomogida, Katsuyuki; and Saito, Hiromasa, 4,128,630, Cl. 424-69.000.

Sakai, Masahiko: *See—*
Toyoda, Shinichi; Sakai, Masahiko; Goto, Kazuo; Narahara, Toshikazu; and Karasawa, Yoshiharu, 4,128,531, Cl. 528-53.000.

Sakai, Tetsushi, to Nippon Telegraph and Telephone Public Corp. Semiconductor integrated circuit devices having inverted frustum-shape contact layers. 4,128,845, Cl. 357-51.000.

Sakamoto, Tatsuo: *See—*
Nomura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, 4,128,682, Cl. 428-138.000.
Nomura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, 4,128,683, Cl. 428-138.000.

Sakurai, Isao: *See—*
Nagano, Akira; Urasaki, Kazuaki; Osato, Akira; and Sakurai, Isao, 4,128,756, Cl. 235-92.0SB.

Sale, Anthony J. H., to Lever Brothers Company. Microwave heating of foods. 4,128,751, Cl. 219-10.55A.

Sallee, Joseph P.: *See—*
Gay, Danny; Horine, James; Hudson, James C.; Sallee, Joseph P.; and Wininger, Hershel R., 4,128,029, Cl. 83-437.000.

Salloga, Fred W.: *See—*
Fenster, Abraham S.; and Salloga, Fred W., 4,128,265, Cl. 285-305.000.

Salon, Sheppard J., to Westinghouse Electric Corp. Stranded conductor for dynamoelectric machines. 4,128,779, Cl. 310-213.000.

Sam Stein Associates, Inc.: *See—*
Deal, Douglas O.; and Morley, Robert C., 4,128,160, Cl. 198-657.000.

Samejima, Shuichi; and Hirade, Kenkichi, to Nippon Telegraph and Telephone Public Corp. Differential detection systems with non-redundant error correction. 4,128,828, Cl. 340-146.1AQ.

Samuel, Robert A.; Kaminski, Gerald W.; and Layne, Michael W. J-Shaped pin for making dental prosthesis with means for debris escape. 4,127,939, Cl. 32-11.000.

Sandberg, Glenn A., to Formax, Inc. Constant-tension conveyor drive for thermal processing apparatus. 4,128,164, Cl. 198-813.000.

Sander, Hans: *See—*
Kroker, Ruprecht; and Sander, Hans, 4,128,521, Cl. 260-31.40R.

Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Bicyclo[2.2.2]-octene derivatives and mixtures thereof. 4,128,729, Cl. 568-820.000.

Sanders, Maggie B., executrix: *See—*
Bourquin, Thomas E., deceased; and Sanders, Maggie B., executrix, 4,127,957, Cl. 43-53.500.

Sandner, Bernhard: *See—*
Rossler, Erich; Deiner, Hans; Sandner, Bernhard; and Schilling, Hans, 4,128,675, Cl. 427-390.00E.

Sandoz, Inc.: *See—*
Hardtmann, Goetz E., 4,128,649, Cl. 424-256.000.

Sandoz Ltd.: *See—*
Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 4,128,549, Cl. 546-202.000.
Schneider, Lukas, 4,128,544, Cl. 260-146.00T.

Sanford Process Corporation: *See—*
Lerner, Moisey; Morse, James H.; and Bessendorf, Mikhael, 4,128,461, Cl. 204-58.000.

Sankyo Organic Chemicals Company Limited: *See—*
Wyant, Robert E.; and Grotta, Henry M., 4,128,429, Cl. 106-15.00R.
Yajima, Kunihiko; and Sayama, Shuji, 4,128,565, Cl. 260-429.700.

Sanyo Electric Co., Ltd.: *See—*
Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, 4,128,138, Cl. 181-167.000.

Sanyo Trading Co., Ltd.: *See—*
Onizawa, Masao, 4,128,539, Cl. 260-4.00R.

Sarantakis, Dimitrios; and Grant, Norman H., to American Home Products Corporation. Pentapeptide with morphine- like activity. 4,128,541, Cl. 260-112.50R.

Sarkes Tarzian, Inc.: *See—*
Krepps, James E., Jr., 4,128,820, Cl. 334-1.000.

Sashihara, Kenji: *See—*
Ikenoue, Shinpei; Masuda, Takao; Suzuki, Nobuo; Tanaka, Toshiharu; and Sashihara, Kenji, 4,128,428, Cl. 96-114.100.

Sato, Masao, to Amada Company, Limited. Horizontal bandsaw machines. 4,128,031, Cl. 83-820.000.

Satoh, Tsuyoshi; and Tachino, Kenzo, to Mitsubishi Denki Kabushiki Kaisha. Elevator speed control system. 4,128,142, Cl. 187-29.00R.

Saumsiegle, Robert W.; and Harry, Ieuan L., to Continental Can Company, Inc. Injection blow molding apparatus. 4,128,374, Cl. 425-403.000.

Sauvey, Donald R.; and Magnuson, Robert E., to Hammond Corporation. Electro-mechanical keyboard memory for an electronic musical instrument. 4,128,036, Cl. 84-441.000.

Savage, Robert J. Investigation of the soundness of structures. 4,128,011, Cl. 73-579.000.

Sawada, Kaoru: *See—*
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,128,187, Cl. 220-464.000.

Sayama, Shuji: *See—*
Yajima, Kunihiko; and Sayama, Shuji, 4,128,565, Cl. 260-429.700.

SCA Development Aktiebolag: *See—*
Wennerblom, Bengt A., 4,128,669, Cl. 427-8.000.

Scaduto, John R. Tool holder. 4,128,026, Cl. 82-11.000.

Scamehorn, John F.: *See—*
Frohreich, Richard A.; and Scamehorn, John F., 4,128,405, Cl. 55-59.000.

Schachar, Ronald A. Horizontally mounted intraocular lens and the method of implantation thereof. 4,127,903, Cl. 3-13.000.

Scherba, Michael B., to PYROHM, INC. Electrical frequency responsive structure. 4,128,818, Cl. 333-70.00S.

Schering Aktiengesellschaft: *See—*
Arndt, Friedrich; and Boroschewski, Gerhard, 4,128,413, Cl. 71-100.000.

Scherrer, Robert A.; and Stern, Richard M., to Riker Laboratories, Inc. Antimicrobial polycyclic nitrofurans. 4,128,659, Cl. 424-285.000.

Schilling, Hans: *See—*
Rossler, Erich; Deiner, Hans; Sandner, Bernhard; and Schilling, Hans, 4,128,675, Cl. 427-390.00E.

Schindler, Walter: *See—*
Badertscher, Hans; and Schindler, Walter, 4,128,307, Cl. 350-263.000.

Schinke, David P.: *See—*
Hartman, Adrian R.; Melchior, Hans; Schinke, David P.; and Smith, Richard G., 4,127,932, Cl. 29-590.000.

Schirmann, Jean-Pierre; Dubreux, Bernard; Bakes, Michel; Delavarenne, Serge-Yvon; and Daude-Lagrave, Marie-Christine, to Produits Chimiques Ugine Kuhlmann. Activators for percompounds. 4,128,494, Cl. 252-186.000.

Schleinkofer, Rudi W., to Ingersoll-Rand Co. System and method for gas phase pulp bleaching. 4,128,454, Cl. 162-49.000.

Schlepphik, Alfred A., to Monsanto Company. 1-(Norborn-5'-en-2'-yl) or 1-(norborn-2'-yl) substituted 1-alken-3-ols and alkan-3-ols. 4,128,509, Cl. 252-522.000.

Schlereth, Fritz H.: *See—*
Irwin, John M.; and Schlereth, Fritz H., 4,128,890, Cl. 364-724.000.

Schlosser, Ernst-Gunther: *See—*
Leupold, Ernst I.; Arpe, Hans-Jurgen; Renken, Albert; and Schlosser, Ernst-Gunther, 4,128,727, Cl. 560-247.000.

Schlup, Gustave E.; and Berger, Edwin, to G. E. Schlup & Co. Device for assembling electronic components on a printed circuit board. 4,127,936, Cl. 29-721.000.

Schmedemann, Walter, to U.S. Philips Corporation. Adjusting device for a section of a medical treatment apparatus or examining apparatus. 4,128,274, Cl. 297-410.000.

Schmeidl, Karl; Brunkhorst, Wilhelm; and Michaelis, Eberhard, to BASF Aktiengesellschaft. Manufacture of a solution of nitrosylsulfuric acid in sulfuric acid. 4,128,623, Cl. 423-388.000.

Schmid, Richard: *See*—
Loch, Friedhelm H.; Mailander, Hans; Riemath, Heinz; Schmid, Richard; and Stickel, Ernst, 4,128,287, Cl. 312-253.000.

Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, to Ciba-Geigy Corporation. Hydroxyphenylated hydantoins. 4,128,718, Cl. 548-313.000.

Schmidt, Oscar W., to New Pneumatics, Inc. Locking and emergency release system for barred windows. 4,127,966, Cl. 49-141.000.

Schmidt, Werner: *See*—
Vollkommer, Norbert; Petersen, Egon N.; Klinkenberg, Herbert; and Schmidt, Werner, 4,128,709, Cl. 526-218.000.

Schmitt, Eugene W., to Harbil, Inc. Brake rigging for dropped bottom gondola cars. 4,128,148, Cl. 188-197.000.

Schmitt, Frederick L.: *See*—
Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., 4,128,729, Cl. 568-820.000.

Schmitz, Lawrence S.: *See*—
Troutman, Bruce L.; and Schmitz, Lawrence S., 4,128,773, Cl. 307-238.000.

Schneider, Lukas, to Sandoz Ltd. Copper complexes of substituted sulfophenyl-azo-phenyl-azo-naphthalene sulfonic acids containing a heterocyclic fiber-reactive group. 4,128,544, Cl. 260-146.00T.

Schneider, William P., to Upjohn Company, The. 6,7-Didehydro-PGI_1 compounds. 4,128,713, Cl. 542-426.000.

Schnepf, Dietmar: *See*—
Gansert, Willi; Bergfried, Dietrich; Heinrich, Gert; Schnepf, Dietmar; Slansky, Harry; Pfluger, Eberhard; and Dorkel, Jean, 4,128,802, Cl. 322-28.000.

Schnizler, Albrecht, Jr., to Metabowerke KG Closs, Rauch & Schnizler. Device for releasably securing an auxiliary tool to a manually held power drill. 4,127,923, Cl. 24-270.000.

Schoemaker, Hubert J. P.: *See*—
Eldred, Emmet W.; and Schoemaker, Hubert J. P., 4,128,629, Cl. 424-1.000.

Schoettle, Klaus: *See*—
Gaiser, Dieter; Woellhaf, Josef; Schoettle, Klaus; Guenther, Friedrich; Kamm, Eugen; and Wendt, Erich, 4,127,925, Cl. 29-430.000.
Senkpiel, Werner; Schoettle, Klaus; Wittkamp, Heinrich; and Uhl, Karl, 4,128,852, Cl. 360-90.000.

Schreyer, Heinz B., to Erwin Sick GmbH Optik-Elektronik. Curve following device. 4,128,481, Cl. 250-202.000.

Schubart, Rolf E. R., to Dorst-Keramikmaschinen-Bau Otto Dorst u. Dipl.-Ing. Walter Schlegel. Apparatus for producing plates and similar articles. 4,128,375, Cl. 425-405.00H.

Schuetz, Robert C. Blank firing adapter. 4,128,040, Cl. 89-14.00E.

Schultheiss, Adrian; and de Courten, Alfred, to Laboratories OM Societe Anonyme. (Bis-diethylamine)2,5-dihydroxybenzene-1,4-disulfonate, useful as a medicament against glaucoma. 4,128,661, Cl. 424-316.000.

Schulz, Robert J., to United States of America, Army. Weapon elevating mechanism having an automatic clutch. 4,128,041, Cl. 89-41.00R.

Schulz, Toni: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; and Schulz, Toni, 4,128,279, Cl. 308-6.00C.

Schupp, Lewis J.: *See*—
Sterling, Vaughn C.; and Schupp, Lewis J., 4,128,858, Cl. 362-13.000.

Schwab Safe Co., Inc.: *See*—
Miller, Norman, 4,127,995, Cl. 70-119.000.

Schwan, Thomas J., to Morton-Norwich Products, Inc. 1-[[1H-Pyrrol-2-ylmethylene]amino]-2,4-imidazolidinedione. 4,128,711, Cl. 542-420.000.

Schwarb, Gustav: *See*—
Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 4,128,549, Cl. 546-202.000.

Schweizer, Eduard H. Stand for holding gramophone records and magnetic tape cassette cases. 4,128,175, Cl. 211-40.000.

Scott, E. Timm: *See*—
Bradbury, William B.; Watts, Robert H.; and Scott, E. Timm, 4,128,211, Cl. 241-101.600.

Scott, John P.; Peters, Dudley C.; and Foster, Richard C. Vehicular battery charging system. 4,128,800, Cl. 322-28.000.

Scovill Manufacturing Company: *See*—
Johnson, John L., 4,128,209, Cl. 239-583.000.

Seaver, James: *See*—
Larson, Gerald L.; Treadwell, William A.; and Seaver, James, 4,128,044, Cl. 91-20.000.

Sebek, Oldrich K.; and Dolak, Lester A., to Upjohn Company, The. Allylic methyl-hydroxylated novobiocins. 4,128,563, Cl. 260-343.450.

SECIM: *See*—
Quehen, Andre, 4,127,997, Cl. 72-19.000.

Sederquist, Richard A., to United Technologies Corp. Fuel cell power plant and method for operating the same. 4,128,700, Cl. 429-17.000.

Sedley, Bruce S. Hand held magnetic card encoder. 4,128,851, Cl. 360-4.000.

Seeger, Alfred. Three-dimensional photography using incoherent light. 4,128,324, Cl. 354-112.000.

Seeger, Richard E., to Chomerics, Inc. Keyboard with concave and convex domes. 4,128,744, Cl. 200-5.00A.

Seemayer, Walter: *See*—
Bloom, William G.; Choksi, Pradip V.; and Seemayer, Walter, 4,128,098, Cl. 128-272.300.

Seiko Koki Kabushiki Kaisha: *See*—
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, 4,127,984, Cl. 58-7.000.

Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, to Toyo Soda Manufacturing Co., Ltd. Carrier for liquid chromatography. 4,128,706, Cl. 526-19.000.

Seki, Shigeo: *See*—
Koyama, Masao; and Seki, Shigeo, 4,128,714, Cl. 544-18.000.

Sekiguchi, Akira: *See*—
Otsu, Shinpei; Sekiguchi, Akira; Tobita, Nobuyoshi; Chikamatsu, Shigeru; Hosoe, Yoshihisa; Matsui, Motoaki; Sugimoto, Noboru; and Totsuka, Noriyoshi, 4,128,378, Cl. 425-445.000.

Selak, Martín M., to Astro Engineering Co. Chemical dispensing system. 4,128,326, Cl. 354-317.000.

Selleck, James R., Jr.: *See*—
Hunsucker, Jerry H.; and Selleck, James R., Jr., 4,128,655, Cl. 424-273.00R.

Selwitz, Charles M.: *See*—
Sabourin, Edward T.; and Selwitz, Charles M., 4,128,588, Cl. 260-645.000.

Sencore, Inc.: *See*—
Westra, Marlin D., 4,128,808, Cl. 325-134.000.

Senkpiel, Werner; Schoettle, Klaus; Wittkamp, Heinrich; and Uhl, Karl, to BASF Aktiengesellschaft. Tape transport mechanism for recording and playing back video signals. 4,128,852, Cl. 360-90.000.

Seo, Iwao, to Mitsubishi Petrochemical Company Limited. Piezo-electric material. 4,128,489, Cl. 252-62.900.

Sevostiyanov, Vladimir P.; Astakhov, Valery V.; and Usachev, Vasily P. Liquid-crystal indicator. 4,128,314, Cl. 350-341.000.

Shadid, Fahim E.; and Johnson, Paul R., to Chicago Bridge & Iron Company. Ship tanks with continuous support system. 4,128,070, Cl. 114-74.00A.

Shah, Niranjan S.: *See*—
Duke, Jack R.; Shah, Niranjan S.; and Woolf, William C., 4,128,883, Cl. 364-200.000.

Shakula, Nikolai M.; Voloschenko, Nikolai I.; Shishkin, Nikolai F.; Muratov, Anatoly S.; Guzchenko, Alexandr P.; Anokhin, Vladimir M.; and Nikitchenko, Vladimir F. Cable repair vulcanizing press. 4,128,367, Cl. 425-11.000.

Sharp, Charles M., to BOC Limited. Laser beam welding. 4,128,753, Cl. 219-121.00L.

Sharp, Christopher J., to Glaxo Laboratories Limited. Cephalosporin antibiotics. 4,128,715, Cl. 544-22.000.

Shaw, Clifford O., to United States of America, Navy. N cycle gated periodic waveform generator. 4,128,774, Cl. 307-260.000.

Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., to BJ-Hughes Inc. Velocity control arrangement for a computer-controlled oil drilling rig. 4,128,888, Cl. 364-565.000.

Shell, Ronald G.: *See*—
Brown, Michael K.; Christou, Kyriakos; Lundquist, David E.; Maidment, Earl P.; and Shell, Ronald G., 4,128,841, Cl. 346-75.000.

Shepherd, Wilburn O.; and Gaslow, Jonathon C., to Dresser Industries, Inc. Flushing and cooling system for pumps. 4,128,362, Cl. 415-112.000.

Shiau, George T.: *See*—
Lin, Tai-Shun; Fischer, Paul H.; Prusoff, William H.; and Shiau, George T., 4,128,639, Cl. 424-180.000.

Shiba, Hiroshi, to Nippon Electric Co., Ltd. Semiconductor device. 4,127,931, Cl. 29-571.000.

Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,128,608, Cl. 260-880.00R.

Shigenobu, Masahiro: *See*—
Yamamoto, Yoshihiko; Shigenobu, Masahiro; and Kuwabara, Hideo, 4,128,768, Cl. 250-535.000.

Shilliday, Douglas J. Orthodontist's instrument for applying elastic arch wire-retaining rings. 4,127,940, Cl. 32-66.000.

Shimizu, Akihiko: *See*—
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,128,706, Cl. 526-19.000.

Shimotsuma, Nobuo, to Kabushiki Kaisha Daini Seikosha. Electronic circuit. 4,128,816, Cl. 331-116.00R.

Shin-Shirasuna Electric Corp.: *See*—
Nakazono, Akio, 4,128,853, Cl. 360-105.000.

Shinagawa Refractories Co., Ltd.: *See*—
Naito, Kiyoshi; and Sukuya, Akio, 4,128,394, Cl. 432-137.000.

Shinkai, Michio: *See*—
Sugiyama, Mitsuhiko; and Shinkai, Michio, 4,128,327, Cl. 355-3.00R.

Shinozaki, Nobuo: *See*—
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, 4,127,984, Cl. 58-7.000.

Shiokawa, Showko; Kusakabe, Takaaki; Moriizumi, Toyosaka; and Yasuda, Tsutomu, to Toko, Inc. Surface elastic wave device. 4,128,819, Cl. 333-72.000.

Shiomura, Tetsunosuke; Kinoshita, Youzou; and Kokue, Yoshio, to Mitsui Toatsu Chemicals, Inc. Method for the production of low density polyethylene. 4,128,607, Cl. 260-878.00B.

Shiozaki, Yasumi: *See*—
Yamada, Koichi; Harato, Takuo; Ishida, Takahiro; and Shiozaki, Yasumi, 4,128,618, Cl. 423-119.000.

Shirahata, Ryuji; Kitamoto, Tatsuji; and Suzuki, Masaaki, to Fuji Photo Film Co., Ltd. Process for the production of a magnetic recording medium. 4,128,691, Cl. 428-336.000.

Shiraishi, Hisashi, to Tomy Kogyo Co., Inc. Toy drawing doll. 4,127,963, Cl. 46-265.000.

Shirasaki, Jun: *See—*
Ohta, Hideyasu; Uozumi, Takahiro; Kanbe, Masaru; Abe, Naoto; Shirasaki, Jun; and Mayama, Masayoshi, 4,128,426, Cl. 96-87.00R.

Shiseido Co., Ltd.: *See—*
Hayashi, Katsutake; Saitoh, Tutomu; Yomogida, Katsuyuki; and Saito, Hiromasa, 4,128,630, Cl. 424-69.000.

Shishkin, Nikolai F.: *See—*
Shakula, Nikolai M.; Voloschenko, Nikolai I.; Shishkin, Nikolai F.; Muratov, Anatoly S.; Guzchenko, Alexandr P.; Anokhin, Vladimir M.; and Nikitchenko, Vladimir F., 4,128,367, Cl. 425-11.000.

Shmuk, Jury A.: *See—*
Liakumovich, Alexandr G.; Pantukh, Boris I.; Sultanova, Mengzda K.; Popov, Vasily P.; Tolstikov, Genrikh A.; Monakov, Jury B.; Juriev, Valery P.; Mandelshtam, Elena Y.; Korotkevich, Boris S.; and Shmuk, Jury A., 4,128,708, Cl. 526-162.000.

Shur-Line Manufacturing Co., Inc.: *See—*
Cupp, Charles D.; Matthies, Bruce J.; and Wood, Frederick J., Jr., 4,127,911, Cl. 15-210.00R.

Shustov, Leonid D.: *See—*
Shustova, Olga A.; Gladyshev, Georgy P.; Kondrashov, Eduard K.; and Shustov, Leonid D., 4,128,707, Cl. 526-43.000.

Shustova, Olga A.; Gladyshev, Georgy P.; Kondrashov, Eduard K.; and Shustov, Leonid D. Method for stabilization of fluoro-organic copolymers of the ethylene series. 4,128,707, Cl. 526-43.000.

Shvetsov, Vladimir A.: *See—*
Ischenko, Vitaly G.; Shvetsov, Vladimir A.; Erygin, Evgeny N.; and Girshik, Roman L., 4,128,197, Cl. 225-97.000.

Sideris, Nikolas: *See—*
Kabelitz, Hans-Peter; and Sideris, Nikolas, 4,128,248, Cl. 277-15.000.

Sieglaff, Charles L.; Hora, Charles J.; and Tiefenbach, Joseph P., to Diamond Shamrock Corporation. Surface-treated soft contact lenses. 4,128,318, Cl. 351-160.00R.

Siemens Aktiengesellschaft: *See—*
Brecht, Heinz, 4,128,826, Cl. 338-204.000.
Soldner, Richard, 4,128,012, Cl. 73-611.000.
Stodberg, Lars; and Sjostrom, Hans, 4,128,767, Cl. 250-513.000.

Sigsbee, Raymond A., to General Electric Company. Nb_3Ge superconductive films. 4,128,121, Cl. 164-46.000.

Silvestri, Anthony J.: *See—*
Mikovsky, Richard J.; and Silvestri, Anthony J., 4,128,505, Cl. 252-465.000.

Simon-Hartley Limited: *See—*
Niblett, David C.; and Capewell, James T., 4,128,267, Cl. 294-81.00R.

Simpson, William M., to Corning Glass Works. Hermetic glass-metal compression seal. 4,128,697, Cl. 428-433.000.

Sinclair, Robert A.: *See—*
Errede, Louis A.; and Sinclair, Robert A., 4,128,513, Cl. 521-50.000.

Sindelar, Ernest C.: *See—*
Beck, Henry E.; Hasten, Jimmie L.; and Sindelar, Ernest C., 4,128,276, Cl. 303-13.000.

Singer, Arnold J.: *See—*
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,128,662, Cl. 424-319.000.

Singer Company, The: *See—*
Zocher, Josef, 4,128,067, Cl. 112-222.000.

Siniscal, Paul D.: *See—*
Rana, Victor F.; and Siniscal, Paul D., 4,128,163, Cl. 198-796.000.

Sink, William H., to Dana Corporation. System for rotating a control shaft. 4,128,045, Cl. 91-217.000.

Sjostrom, Hans: *See—*
Stodberg, Lars; and Sjostrom, Hans, 4,128,767, Cl. 250-513.000.

SKF Kugellagerfabriken GmbH: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; and Schulz, Toni, 4,128,279, Cl. 308-6.00C.

Skinner, Earl; Emeott, Marvin; and Jevne, Allan, to General Mills Chemicals, Inc. Interpenetrating dual cure resin compositions. 4,128,600, Cl. 260-859.00R.

Skliris, Lewis E. Rocket launching mechanism. 4,128,039, Cl. 89-1.803.

Slansky, Harry: *See—*
Gansert, Willi; Bergfried, Dietrich; Heinrich, Gert; Schnepf, Dietmar; Slansky, Harry; Pfluger, Eberhard; and Dorkel, Jean, 4,128,802, Cl. 322-28.000.

Slingerland, Henry H., Jr. Vegetation trimmer with cuttings catcher. 4,127,938, Cl. 30-132.000.

Smith, Clifford E.; and Holtz, Hans D., to Phillips Petroleum Company. Alkylation of olefins with paraffins utilizing aluminum halide and group VA metal halide intercalated in graphite. 4,128,596, Cl. 260-683.530.

Smith, Eugene L., Jr.: *See—*
Wang, Samuel S.; and Smith, Eugene L., Jr., 4,128,475, Cl. 209-166.000.

Smith, George W.; Kaplit, Michael; and Hayden, Daniel B., to General Motors Corporation. Heater control method for liquid crystal devices. 4,128,311, Cl. 350-331.000.

Smith, Richard G.: *See—*
Hartman, Adrian R.; Melchior, Hans; Schinke, David P.; and Smith, Richard G., 4,127,932, Cl. 29-590.000.

Smith, Richard N., to Sybron Corporation. Electrodialysis of pickle liquor. 4,128,465, Cl. 204-180.00P.

Smith, Robert L.: *See—*
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,128,564, Cl. 260-401.000.

Smith, William N.; Malpass, Dennis B.; and Merkley, Joseph H., to Texas Alkyls, Inc. Process for the preparation of organo-magnesium complexes. 4,128,501, Cl. 252-431.00R.

SmithKline Corporation: *See—*
Berges, David A., 4,128,722, Cl. 544-26.000.
Bondinell, William E.; and Pendleton, Robert G., 4,128,666, Cl. 424-330.000.

SMW Packaging Corporation: *See—*
Roehn, Herbert F., 4,127,977, Cl. 53-565.000.

Snamprogetti, S.p.A.: *See—*
Corbellini, Margherita; and Balducci, Agostino, 4,128,566, Cl. 260-448.00R.
Corbellini, Margherita; and Balducci, Agostino, 4,128,567, Cl. 260-448.00R.

Snap-on Tools Corporation: *See—*
Green, Talmage O., 4,127,928, Cl. 29-453.000.

Sneed, Jackson B., to Humphreys, Hutcheson & Moseley. Flame shielding device. 4,128,393, Cl. 431-351.000.

Snelgrove, James A.: *See—*
Fabel, David A.; Snelgrove, James A.; and Fariss, Robert H., 4,128,694, Cl. 428-412.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Barba, Diego; D'Agostini, Candido; and Pasquinelli, Aldo, 4,128,457, Cl. 203-29.000.

Societe Anonyme Automobiles Citroen: *See—*
Grosseau, Albert, 4,128,151, Cl. 192-4.00A.

Societe Anonyme dite: CECA S.A.: *See—*
Caron, Jacques; Poncet, Jean-Claude; and Varney, Bernard, 4,128,004, Cl. 73-38.000.

Societe Anonyme Dite: Laboratoire L. Lafon: *See—*
Lafon, Louis, 4,128,656, Cl. 424-282.000.

Societe Europeene de Propulsion: *See—*
Habermann, Helmut; Brunet, Maurice; and Joly, Pierre, 4,128,795, Cl. 318-618.000.

Soderberg Manufacturing Co., Inc.: *See—*
Thompson, Harold R., 4,128,862, Cl. 362-217.000.

Soldner, Richard, to Siemens Aktiengesellschaft. Ultrasonic examination apparatus operating according to the impulse-echo method. 4,128,012, Cl. 73-611.000.

Sommer, John G.: *See—*
Britton, James E.; Metcalf, Fredric D.; Sommer, John G.; Kuan, Tiong H.; Rilling, Victor R.; and Welch, John A., 4,128,523, Cl. 260-33.6AQ.

Sone, Shigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotor housing for a rotary engine. 4,128,366, Cl. 418-83.000.

Sonobe, Tadasi, to Hitachi, Ltd. Rotor having improved arm structure to reduce tensile stresses. 4,128,780, Cl. 310-265.000.

Sony Corporation: *See—*
Hoshi, Kinji; and Sugita, Kazuhiro, 4,127,969, Cl. 51-283.00R.
Suzuki, Tadao; and Yoshida, Tadao, 4,128,813, Cl. 330-264.000.

Sorce, Peter S.; and Clifford, Earl W., to Aro Corporation, The. Roller members for use in heat sealing apparatus. 4,128,451, Cl. 156-555.000.

South African Inventions Development Corporation, The: *See—*
Butler, Louis R. P., 4,128,336, Cl. 356-307.000.

Spaderna, Conan H. Latching switch. 4,128,749, Cl. 200-254.000.

Spector, George: *See—*
Nighswonger, James; and Spector, George, 4,128,193, Cl. 222-402.210.

Spectra-Physics, Inc.: *See—*
Rock, John V., 4,128,476, Cl. 210-31.00C.

Sperry Rand Corporation: *See—*
Lund, Roger E.; and Hanson, Marlin M., 4,128,898, Cl. 365-2.000.
Parrish, Charles A.; and Webb, Bryant F., 4,127,981, Cl. 56-14.400.
Pertl, Jerry H.; and Koehler, Howard A., 4,128,874, Cl. 364-200.000.
Thurber, Kenneth J.; and Strauss, Jon C., 4,128,875, Cl. 364-200.000.

Spevack, Jerome S., to Deuterium Corporation. Contact apparatus for multiphase processing. 4,128,406, Cl. 55-237.000.

Spinello, John O.: *See—*
Hicks, Alan A.; Spinello, John O.; and Breslow, Jeffrey D., 4,128,246, Cl. 273-243.000.

Spiteri, Joseph. Truck marker light. 4,128,860, Cl. 362-80.000.

Spitler, Keith G.; and Radovich, David A., to Mobay Chemical Corporation. Post treatment of flexible polyurethane foam with organic siloxanes for increasing the water absorbency and penetration. 4,128,512, Cl. 521-55.000.

Springfield Tool & Die, Inc.: *See—*
Knibbe, Jan C.; and McPhee, Willard J., 4,128,028, Cl. 83-411.00R.

Square D Company: *See—*
Peterson, Maurice W., Jr., 4,128,822, Cl. 335-8.000.

Stagg, Malcolm J.: *See—*
Metcalfe, Paul E.; Rollo, Randall W.; and Stagg, Malcolm J., 4,128,678, Cl. 428-119.000.

Stahlecker, Otto: *See—*
Baumer, Wilhelm; Bernhard, Horst; Esselborn, Reiner; Ohngemach, Jorg; Stahlecker, Otto; and Zureda, Fritz, 4,128,435, Cl. 106-148.000.

Stamatiou, Dimitri S.; and Stamatiou, Lila D., to Pneumatic Force Feeder, Inc. Method for separating light-weight compressible material. 4,128,404, Cl. 55-1.000.

Stamatiou, Lila D.: *See—*
Stamatiou, Dimitri S.; and Stamatiou, Lila D., 4,128,404, Cl. 55-1.000.

Standard Oil Company, The: *See—*
Bond, Thomas J.; Kelly, William J.; and Adams, Richard C., 4,128,383, Cl. 425-529.000.
Jones, Richard H., 4,128,597, Cl. 260-683.620.

Standard Oil Company (Indiana): *See—*
Kildahl, Nicholas K.; and Fotis, Peter, 4,128,502, Cl. 252-431.00R.

Stanley Electric Co., Ltd.: *See—*
Okazaki, Kunio, 4,128,770, Cl. 307-10.0LS.

Starcher, David: *See—*
Cooper, Charles R., Jr.; Ellis, Charles K.; and Starcher, David, 4,128,359, Cl. 404-72.000.

Stauffer Chemical Company: *See—*
Matsumoto, Kent E.; Chan, Jimmy H.; and Baker, Don R., 4,128,580, Cl. 260-566.00A.

Stayer, Mark L.: *See—*
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,128,710, Cl. 528-168.000.

Steck, Werner: *See—*
Wunsch, Gerd; Deigner, Paul; Falk, Roland; Mahler, Karl; Loeser, Werner; Domas, Friedrich; Felleisen, Peter; and Steck, Werner, 4,128,672, Cl. 427-130.000.

Steckel, Thoams F., to Lubrizol Corporation, The. Overbased phenoxide-halo carboxylic acid condensate additives for lubricants. 4,128,488, Cl. 252-33.600.

Steeghs, Martin H. G., to U.S. Philips Corporation. Cathode ray tube for displaying colored pictures. 4,128,790, Cl. 315-382.000.

Steele Associates, Inc.: *See—*
Steele, Bazil E.; and Micheel, Paul O., 4,128,348, Cl. 400-198.000.

Steele, Bazil E.; and Micheel, Paul O., to Steele Associates, Inc. Method and apparatus for applying ink to ribbons. 4,128,348, Cl. 400-198.000.

Stein, Charles R.: *See—*
Cole, Herbert S., Jr.; and Stein, Charles R., 4,128,313, Cl. 350-340.000.

Stemme, Otto; and Lermann, Peter, to Agfa-Gevaert AG. Instant-picture camera. 4,128,322, Cl. 354-83.000.

Stemme, Otto: *See—*
Wick, Richard; Stemme, Otto; Lermann, Peter; and Fauth, Gunter, 4,128,323, Cl. 354-86.000.

Stenzel, Jurgen; and Heymer, Gero, to Hoechst Aktiengesellschaft. Production of phosphine. 4,128,620, Cl. 423-299.000.

Sterling, Vaughn C.; and Schupp, Lewis J., to General Electric Company. Multiple flashlamp system. 4,128,858, Cl. 362-13.000.

Stern, Elaine S.: *See—*
Johnsen, Vernon L.; and Stern, Elaine S., 4,128,543, Cl. 260-123.700.

Stern, Richard M.: *See—*
Scherrer, Robert A.; and Stern, Richard M., 4,128,659, Cl. 424-285.000.

Sternbeck, Olaf, to Telefonaktiebolaget L M Ericsson. Electronic crosspoint array. 4,128,741, Cl. 179-18.0GF.

Stevens, William M., to Randam Electronics, Inc. Strengthened scintillation cell. 4,128,766, Cl. 250-483.000.

Stewart, Bonner B., to Stewart, Hazel F. Telescoping room for travel trailers. 4,128,269, Cl. 296-23.00C.

Stewart, Hazel F.: *See—*
Stewart, Bonner B., 4,128,269, Cl. 296-23.00C.

Stich, Frederick A., to Allis-Chalmers Corporation. Power circuit for variable frequency, variable magnitude power conditioning system. 4,128,793, Cl. 318-808.000.

Stickel, Ernst: *See—*
Loch, Friedhelm H.; Mailander, Hans; Riemath, Heinz; Schmid, Richard; and Stickel, Ernst, 4,128,287, Cl. 312-253.000.

Stodberg, Lars; and Sjostrom, Hans, to Siemens Aktiengesellschaft. X-ray primary radiation diaphragm assembly. 4,128,767, Cl. 250-513.000.

Stoltz, Woodrow W.; and Thatcher, Charles R. Apparatus for applying powdered coating materials to the outer periphery of objects. 4,128,078, Cl. 118-603.000.

Stork Brabant B.V.: *See—*
Vertegaal, Jacobus G., 4,128,056, Cl. 101-128.100.

Stotts, Larry B.; Martin, William E.; and Catano, Paul S., to United States of America, Navy. Optical logic elements. 4,128,300, Cl. 350-96.140.

Straffi, Franco, to Breda Termomeccanica S.p.A. Construction of a supporting grid for pipes. 4,128,221, Cl. 248-68.00R.

Straitz, John F., III, to Combustion Unlimited Incorporated. Flare stack gas burner. 4,128,389, Cl. 431-202.000.

Straitz, John F., III, to Combustion Unlimited Incorporated. Thermocouple and mounting therefor. 4,128,734, Cl. 136-232.000.

Strauss, Jon C.: *See—*
Thurber, Kenneth J.; and Strauss, Jon C., 4,128,875, Cl. 364-200.000.

Streit, Werner; Fikentscher, Rolf; Gans, Karl; and Welzel, Gerhard, to BASF Aktiengesellschaft. Water-soluble, crosslinked nitrogenous condensation products produced by reaction of chlorohydrin-ethers with ethyleneimine. 4,128,511, Cl. 528-424.000.

Stroud, Richard M.: *See—*
Kolakowski, Richard A.; and Stroud, Richard M., 4,128,611, Cl. 264-51.000.

Strunc, Gerald R.; and Laciak, Francis M., to Pako Corporation. Microprocessor controlled photographic paper cutter. 4,128,887, Cl. 364-475.000.

Sturzenegger, August; Mlodozeniec, Arthur R.; and Lipinsky, Edward S., to Hoffmann-La Roche Inc. Manufacture of pharmaceutical unit dosage forms. 4,128,445, Cl. 156-64.000.

Stvan, Richard T.: *See—*
Hansen, George E.; and Stvan, Richard T., 4,128,111, Cl. 137-515.700.

Suggs, Robert, to Reliance Electric Company. Instant silvering solution. 4,128,671, Cl. 427-125.000.

Sugimoto, Noboru: *See—*
Otsu, Shinpei; Sekiguchi, Akira; Tobita, Nobuyoshi; Chikamatsu, Shigeru; Hosoe, Yoshihisa; Matsui, Motoaki; Sugimoto, Noboru; and Totsuka, Noriyoshi, 4,128,378, Cl. 425-445.000.

Sugita, Kazuhiro: *See—*
Hoshi, Kinji; and Sugita, Kazuhiro, 4,127,969, Cl. 51-283.00R.

Sugiyama, Mitsuhiko; and Shinkai, Michio, to Rank Xerox Limited. Transfer material feed apparatus for electrophotographic copying machines. 4,128,327, Cl. 355-3.00R.

Sukuya, Akio: *See—*
Naito, Kiyoshi; and Sukuya, Akio, 4,128,394, Cl. 432-137.000.

Sultanova, Mengzda K.: *See—*
Liakumovich, Alexandr G.; Pantukh, Boris I.; Sultanova, Mengzda K.; Popov, Vasily P.; Tolstikov, Genrikh A.; Monakov, Jury B.; Juriev, Valery P.; Mandelshtam, Elena Y.; Korotkevich, Boris S.; and Shmuk, Jury A., 4,128,708, Cl. 526-162.000.

Sulzer Brothers Limited: *See—*
Bomio, Pietro; and Meier, Werner, 4,128,684, Cl. 428-175.000.
Braun, Rudolf; and Kellmann, Werner, 4,128,115, Cl. 139-439.000.
Purtschert, Werner, 4,128,280, Cl. 308-9.000.

Sumitomo Aluminium Smelting Company, Ltd.: *See—*
Yamada, Koichi; Harato, Takuo; Ishida, Takahiro; and Shiozaki, Yasumi, 4,128,618, Cl. 423-119.000.

Sumitomo Chemical Company, Limited: *See—*
Oyamada, Takeo; Tomizawa, Choji; Domoto, Masahiro; and Narisawa, Shizuo, 4,128,518, Cl. 260-29.6WB.
Ura, Shigeru; Kondo, Norio; Fukuyama, Yoshiya; and Nakahara, Makoto, 4,128,437, Cl. 106-287.240.

Sumiyoshi, Masaharu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,128,081, Cl. 123-32.0SP.

Summers, Jack C.: *See—*
Hegedus, Louis; and Summers, Jack C., 4,128,506, Cl. 252-466.0PT.

Sumner, Harry H.: *See—*
Hadfield, Harry R.; Sumner, Harry H.; and Williams, Gerald, 4,128,395, Cl. 8-2.50A.

Sun Electric Corporation: *See—*
Arnston, Robert W.; Trussell, Gerald C.; and Rich, Leo G., 4,128,005, Cl. 73-117.300.

Sundlof, Kenneth C. Flower car converting unit. 4,128,268, Cl. 296-10.000.

Sunnex Equipment AB: *See—*
Blomqvist, Inge. S., 4,128,227, Cl. 251-42.000.

Sussman, Milton H., to American Optical Corporation. Abbe condenser. 4,128,304, Cl. 350-189.000.

Sutherland, Alexander R., to Sutherland, Iris Jean Carrington, a part interest. Rotary engine. 4,128,084, Cl. 123-55.0AA.

Sutherland, Iris Jean Carrington: *See—*
Sutherland, Alexander R., 4,128,084, Cl. 123-55.0AA.

Suzuki, Masaaki: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; and Suzuki, Masaaki, 4,128,691, Cl. 428-336.000.

Suzuki, Minoru, to Ricoh Company, Ltd. Mounting apparatus for a drum and developing roll in a developing unit of magnetic brush type. 4,128,079, Cl. 118-658.000.

Suzuki, Nobuo: *See—*
Ikenoue, Shinpei; Masuda, Takao; Suzuki, Nobuo; Tanaka, Toshiharu; and Sashihara, Kenji, 4,128,428, Cl. 96-114.100.

Suzuki, Tadao; and Yoshida, Tadao, to Sony Corporation. Amplifier. 4,128,813, Cl. 330-264.000.

Svec, Paul S., to General Electric Company. Composition for making an investment mold for casting and solidification of superalloys therein. 4,128,431, Cl. 106-38.350.

Swapp, Mavin C.: *See—*
Frisbie, Milo W.; and Swapp, Mavin C., 4,128,174, Cl. 209-573.000.

Swenson, Henry F. Cutting tool bit and grinding fixture for sharpening said bit for use in an axially actuated back spot facing tool. 4,128,360, Cl. 407-114.000.

Sybron Corporation: *See—*
Smith, Richard N., 4,128,465, Cl. 204-180.00P.

Szmuszkovicz, Jacob, to Upjohn Company, The. Anilide derivatives as antidepressants. 4,128,663, Cl. 424-324.000.

Tachino, Kenzo: *See—*
Satoh, Tsuyoshi; and Tachino, Kenzo, 4,128,142, Cl. 187-29.00R.

Tagawa, Kazuaki: *See—*
Yanagawa, Nobuyuki; and Tagawa, Kazuaki, 4,128,334, Cl. 355-75.000.

Takahashi, Kazuo: *See—*
Morinaka, Yasuhiro; and Takahashi, Kazuo, 4,128,646, Cl. 424-251.000.

Takanashi, Haruyuki: *See—*
Hase, Takashi; Yoshikawa, Masatake; and Takanashi, Haruyuki, 4,128,498, Cl. 252-301.40F.

Takei, Yoshihiro, to Kabushiki Kaisha Suwa Seikosha. Charging circuit. 4,128,798, Cl. 320-23.000.

Takekoshi, Tohru: *See—*
Markezich, Ronald L.; and Takekoshi, Tohru, 4,128,574, Cl. 562-473.000.

Takimoto, Masatami; Teramura, Mitsuyoshi; and Urushidani, Masahiro,

to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation apparatus for an internal combustion engine. 4,128,089, Cl. 123-119.00A.

Taliani, Laurent: *See—*
Perronnet, Jacques; and Taliani, Laurent, 4,128,562, Cl. 260-332.30R.

Tamers, Murry A. Method for introducing carbon into evacuated or pressurized reaction vessels and reaction products therefrom. 4,128,624, Cl. 423-439.000.

Tanaka, Akira; Hayashi, Yuji; Kassai, Makoto; and Hara, Toshito, to Fujitsu Limited. Switch. 4,128,823, Cl. 335-196.000.

Tanaka, Shigenori, to Nissan Motor Company, Limited. Yarn waste removing means for air jet weaving loom. 4,128,114, Cl. 139-435.000.

Tanaka, Taro: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,128,081, Cl. 123-32.0SP.

Tanaka, Toshiharu: *See—*
Ikenoue, Shinpei; Masuda, Takao; Suzuki, Nobuo; Tanaka, Toshiharu; and Sashihara, Kenji, 4,128,428, Cl. 96-114.100.

Tanaka, Tsugane: *See—*
Kikuchi, Katsuro; Masai, Shohachi; and Tanaka, Tsugane, 4,128,695, Cl. 428-423.000.

Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,128,081, Cl. 123-32.0SP.

Tang, Donald T.: *See—*
Lin, Yeong S.; Liu, Chao N.; and Tang, Donald T., 4,128,891, Cl. 364-900.000.

Tantum, James G.: *See—*
Adams, Stewart S.; Armitage, Bernard J.; Nicholson, John S.; and Tantum, James G., 4,128,573, Cl. 562-465.000.

Tatsuzawa, Kunio: *See—*
Nozawa, Kazutoshi; Ashibe, Yasue; Aruga, Hatsuo; and Tatsuzawa, Kunio, 4,127,986, Cl. 58-134.000.

Taylor, Donald F., to Otis Engineering Corporation. Swivel connector. 4,128,127, Cl. 166-105.000.

Taylor, George P.: *See—*
Ames, Richard N.; Hardin, Dick K.; Leininger, Joel C.; and Taylor, George P., 4,128,876, Cl. 364-200.000.

Taylor, Henry F.: *See—*
Hunt, Barry R.; Dillard, George M.; and Taylor, Henry F., 4,128,759, Cl. 250-199.000.

Taylor, Herman, Jr.: *See—*
Malone, Huey P.; Paraskos, John A.; and Taylor, Herman, Jr., 4,128,471, Cl. 208-8.000.

Taylor, Ward G.: *See—*
Harless, Charles E.; and Taylor, Ward G., 4,127,937, Cl. 30-90.700.

Technica-Guss GmbH: *See—*
Krall, Heribert A.; and Maag, Helmut, 4,128,122, Cl. 164-438.000.

Technigaz: *See—*
Kotcharian, Michel, 4,128,069, Cl. 114-74.00A.

Teepak, Inc.: *See—*
Trimble, Roy L., 4,127,918, Cl. 17-41.000.

Tega, Ezio; and Volpi, Danilo, to Metalmeccanica Gori & Zucchi MGZ S.p.A. Machine for manufacturing chains having differentiated links. 4,127,987, Cl. 59-16.000.

Tegethoff, Jon E.: *See—*
Fender, Ferdinand G.; and Tegethoff, Jon E., 4,128,340, Cl. 356-218.000.

Teijin Limited: *See—*
Okaniwa, Hiroshi; and Yatabe, Toshiaki, 4,128,702, Cl. 429-27.000.

Teijin Seiki Company Limited: *See—*
Nishiba, Kenzo, 4,128,048, Cl. 91-491.000.

Telefonaktiebolaget L M Ericsson: *See—*
Sternbeck, Olaf, 4,128,741, Cl. 179-18.0GF.

Teramura, Mitsuyoshi: *See—*
Takimoto, Masatami; Teramura, Mitsuyoshi; and Urushidani, Masahiro, 4,128,089, Cl. 123-119.00A.

Terasaki, Wesley L.: *See—*
Brooker, Gary L.; Terasaki, Wesley L.; and Price, Michael G., 4,128,628, Cl. 424-1.000.

Terekhov, Kuzma I.; Tumanov, Alexei T.; Ozerova, Alexandra P.; Topilin, Valentin V.; Dzugutov, Mikhail Y.; Ljubinskaya, Mara A.; Pashchnik, Gennady A.; Nikishov, Alexandr S.; and Ustinov, Terenty I. Nickel-base alloy. 4,128,419, Cl. 75-171.000.

Terry, James A., deceased; Russell, Barbara P., heir; Terry, James F., heir; and Cain, Shirley A., heir. Log preparing apparatus. 4,128,117, Cl. 144-3.00K.

Terry, James F., heir: *See—*
Terry, James A., deceased; Russell, Barbara P., heir; Terry, James F., heir; and Cain, Shirley A., heir, 4,128,117, Cl. 144-3.00K.

Tessier, Jean: *See—*
Martel, Jacques; and Tessier, Jean, 4,128,584, Cl. 260-586.00R.

Texaco Development Corp.: *See—*
Yeakey, Ernest L.; and Waddill, Harold G., 4,128,525, Cl. 260-29.10R.

Texaco Inc.: *See—*
Harrison, Charles W.; and Bozeman, Paul P., Jr., deceased, 4,128,472, Cl. 208-33.000.
Powell, Justin C.; and McMahon, Matthew A., 4,128,401, Cl. 44-1.00R.

Texas Alkyls, Inc.: *See—*
Smith, William N.; Malpass, Dennis B.; and Merkley, Joseph H., 4,128,501, Cl. 252-431.00R.

Textron Inc.: *See—*
Caero, Jose G., 4,128,047, Cl. 91-420.000.

Th. Kieserling & Albrecht: *See—*
Lorenz, Horst, 4,127,999, Cl. 72-290.000.

Thatcher, Charles R.: *See—*
Stoltz, Woodrow W.; and Thatcher, Charles R., 4,128,078, Cl. 118-603.000.

Thomas, John C., to Vickers Limited. Coating with antifriction metal. 4,127,930, Cl. 29-527.600.

Thomas, Norman W.; Berardinelli, Frank M.; and Edelman, Robert, to Celanese Corporation. Polyamides for extrusion applications. 4,128,599, Cl. 260-857.00R.

Thompson, Edward E.: *See—*
Peters, John; and Thompson, Edward E., 4,127,958, Cl. 43-81.000.

Thompson, Harold R., to Soderberg Manufacturing Co., Inc. Lamp mounting. 4,128,862, Cl. 362-217.000.

Thomson-Brandt: *See—*
Lehureau, Jean-Claude; Malissin, Roland; and Roullet, Gerald, 4,128,309, Cl. 350-295.000.
Roullet, Gerald; and Bortuzzo, Jean-Pierre, 4,128,847, Cl. 358-128.000.

Thomson-CSF: *See—*
Tournois, Pierre; and Maerfeld, Charles, 4,128,615, Cl. 310-313.000.

Thurber, Kenneth J.; and Strauss, Jon C., to Sperry Rand Corporation. Optional virtual memory system. 4,128,875, Cl. 364-200.000.

Tiefenbach, Joseph P.: *See—*
Sieglaff, Charles L.; Hora, Charles J.; and Tiefenbach, Joseph P., 4,128,318, Cl. 351-160.00R.

Tillinghast, William S.; and Rochelle, William R., to Brown & Root, Inc. Bottom jetting device. 4,127,950, Cl. 37-62.000.

Timan, Dirk A.: *See—*
Bretts, Gerald R.; and Timan, Dirk A., 4,128,459, Cl. 204-28.000.

Timex Corporation: *See—*
Zanoni, Louis A., 4,128,315, Cl. 350-357.000.
Zanoni, Louis A., 4,128,316, Cl. 350-357.000.

Timson, William J., to Polaroid Corporation. Manipulation of coating streams with air foils. 4,128,667, Cl. 427-348.000.

Tinney, Francis J.: *See—*
Rebstock, Mildred C.; Nicolaides, Ernest D.; Mick, Thomas F.; Tinney, Francis J.; and Wittle, Eugene L., 4,128,540, Cl. 260-112.50R.

Tioxide Group Limited: *See—*
Bennett, Anthony E., 4,128,409, Cl. 62-26.000.

Tiritilli, Leonard A. Gun sight. 4,127,943, Cl. 33-260.000.

T'Jampens, Germain R.: *See—*
Giller, Henricus F. J. I.; and T'Jampens, Germain R., 4,128,783, Cl. 313-174.000.

TMC Corporation: *See—*
Weigl, Erwin, 4,128,256, Cl. 280-605.000.

Tobias, Michael A.; and Martinez, Carlos J., to Mobil Oil Corporation. Water reducible epoxy esters and coating compositions containing them. 4,128,515, Cl. 260-18.0EP.

Tobin-Arp Manufacturing Company: *See—*
Flaten, James F., 4,127,942, Cl. 33-181.0AT.

Tobita, Nobuyoshi: *See—*
Otsu, Shinpei; Sekiguchi, Akira; Tobita, Nobuyoshi; Chikamatsu, Shigeru; Hosoe, Yoshihisa; Matsui, Motoaki; Sugimoto, Noboru; and Totsuka, Noriyoshi, 4,128,378, Cl. 425-445.000.

Tock, Wilfred H., to Fuller Company. Calciner for fine limestone. 4,128,392, Cl. 432-58.000.

Toko, Inc.: *See—*
Shiokawa, Showko; Kusakabe, Takaaki; Moriizumi, Toyosaka; and Yasuda, Tsutomu, 4,128,819, Cl. 333-72.000.

Tokyo Sanyo Elctric Co., Ltd.: *See—*
Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, 4,128,138, Cl. 181-167.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Gomi, Hiroshi, 4,128,817, Cl. 331-177.00R.

Tolstikov, Genrikh A.: *See—*
Liakumovich, Alexandr G.; Pantukh, Boris I.; Sultanova, Mengzda K.; Popov, Vasily P.; Tolstikov, Genrikh A.; Monakov, Jury B.; Juriev, Valery P.; Mandelshtam, Elena Y.; Korotkevich, Boris S.; and Shmuk, Jury A., 4,128,708, Cl. 526-162.000.

Tomashek, James R.: *See—*
Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., 4,128,888, Cl. 364-565.000.

Tomizawa, Choji: *See—*
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Tomy Kogyo Co., Inc.: *See—*
Shiraishi, Hisashi, 4,127,963, Cl. 46-265.000.

Topilin, Valentin V.: *See—*
Terekhov, Kuzma I.; Tumanov, Alexei T.; Ozerova, Alexandra P.; Topilin, Valentin V.; Dzugutov, Mikhail Y.; Ljubinskaya, Mara A.; Pashchnik, Gennady A.; Nikishov, Alexandr S.; and Ustinov, Terenty I., 4,128,419, Cl. 75-171.000.

Toshiba Chemical Products Co. Ltd.: *See—*
Makino, Kiyoji; and Ohkawa, Tsutomu, 4,128,598, Cl. 260-837.00R.

Totsuka, Noriyoshi: *See—*
Otsu, Shinpei; Sekiguchi, Akira; Tobita, Nobuyoshi; Chikamatsu, Shigeru; Hosoe, Yoshihisa; Matsui, Motoaki; Sugimoto, Noboru; and Totsuka, Noriyoshi, 4,128,378, Cl. 425-445.000.

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Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,128,706, Cl. 526-19.000.
Toyoda, Shinichi; Sakai, Masahiko; Goto, Kazuo; Narahara, Toshikazu; and Karasawa, Yoshiharu, to Hitachi Chemical Company, Ltd. Thermosetting resin composition. 4,128,531, Cl. 528-53.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Aoki, Keiji, 4,128,082, Cl. 123-32.0EA.
Nomura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, 4,128,682, Cl. 428-138.000.
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Sone, Shigeru, 4,128,366, Cl. 418-83.000.
Takimoto, Masatami; Teramura, Mitsuyoshi; and Urushidani, Masahiro, 4,128,089, Cl. 123-119.00A.
Yokota, Masato; and Kobayashi, Hideo, 4,128,092, Cl. 123-191.00S.
Transducers, Inc.: *See—*
Marks, Eugene A., 4,128,001, Cl. 73-1.00B.
Traxler, James T.; Lira, Emil P.; and Kraemer, John F., to International Minerals & Chemical Corp. Modified clay paper coating. 4,128,263, Cl. 282-27.500.
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Larson, Gerald L.; Treadwell, William A.; and Seaver, James, 4,128,044, Cl. 91-20.000.
Trent, Donald. Sway limiting linkage for a vehicle. 4,128,259, Cl. 280-689.000.
Treuner, Uwe D., to E. R. Squibb & Sons, Inc. 4-Halo derivatives of pyrazolo[1,5-a]-quinoxaline-3-carboxylic acids and esters. 4,128,716, Cl. 544-346.000.
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Breuer, Hermann; and Treuner, Uwe D., 4,128,723, Cl. 544-25.000.
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Trico Products Corporation: *See—*
Deibel, Raymond A.; Gowans, Neil A.; and Riester, William C., 4,127,912, Cl. 15-250.420.
Trimble, Roy L., to Teepak, Inc. Shirring machine mandrel. 4,127,918, Cl. 17-41.000.
Triplex Safety Glass Company Limited: *See—*
Boardman, James; and Ash, Peter M., 4,128,690, Cl. 428-332.000.
Troutman, Bruce L.; and Schmitz, Lawrence S., to Hughes Aircraft Company. Volatile/non-volatile logic latch circuit. 4,128,773, Cl. 307-238.000.
True Manufacturing Co., Inc.: *See—*
Trulaske, James A., 4,127,968, Cl. 49-404.000.
Trulaske, James A., to True Manufacturing Co., Inc. Debris-collecting assembly for sliding door track. 4,127,968, Cl. 49-404.000.
Trussell, Gerald C.: *See—*
Arnston, Robert W.; Trussell, Gerald C.; and Rich, Leo G., 4,128,005, Cl. 73-117.300.
TRW Inc.: *See—*
Formanik, Bert J., 4,128,463, Cl. 204-146.000.
Kinder, Mark R., 4,128,023, Cl. 74-750.00R.
Zehren, James N., 4,128,735, Cl. 174-65.00R.
Tsavaris, Emmanuel J. Hotwell alarm system. 4,128,833, Cl. 340-603.000.
Tschursch, Arnold, to Fritzmeier AG. Ratchet transmission. 4,128,152, Cl. 192-43.100.
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Kurita, Masaru; Jomon, Kazuyoshi; Komori, Tadaaki; Nakatani, Isami; and Tsuji, Masahiro, 4,128,546, Cl. 260-239.00A.
Tsuji, Yoshio: *See—*
Hayama, Noboru; and Tsuji, Yoshio, 4,128,057, Cl. 101-128.200.
Tsunoo, Masahiko: *See—*
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Brodsky, Lee; Lorenz, Donald H.; Nelsen, Suzanne B.; and Tu, Shu T., 4,128,536, Cl. 427-54.000.
Tucker, William. Resonant re-entrant cavity whip antenna. 4,128,840, Cl. 343-715.000.
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Heaps, Joseph D.; and Tufte, Obert N., 4,128,680, Cl. 428-137.000.
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Castonguay, Roger N.; Jencks, Charles L.; and Turton, Robert C., 4,128,750, Cl. 200-308.000.
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Uchida, Isamu: *See—*
Kobori, Toshio; and Uchida, Isamu, 4,128,321, Cl. 354-23.00R.
Uddeholms Aktiegolag: *See—*
Norstrom, Gote J. W., 4,128,103, Cl. 134-143.000.
Uhl, Karl: *See—*
Senkpiel, Werner; Schoettle, Klaus; Wittkamp, Heinrich; and Uhl, Karl, 4,128,852, Cl. 360-90.000.
Ulin, Roy A., to Akzona Incorporated. Support member for a disposable thermometer. 4,128,007, Cl. 73-352.000.
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Moked, Isaac; Yi, Kenneth C.; McDonald, John O.; and Lee, Jannan G., 4,128,343, Cl. 366-101.000.
Union Oil Company of California: *See—*
Knight, Robert K., 4,128,482, Cl. 252-8.55D.
Mickelson, Grant A., 4,127,989, Cl. 60-641.000.
United Aircraft Products, Inc.: *See—*
Gersbacher, Harry C., 4,128,235, Cl. 269-234.000.
United States Gypsum Company: *See—*
Wendt, Alan C., 4,127,974, Cl. 52-288.000.
United States of America
Air Force: *See—*
Hart, William A., 4,128,113, Cl. 137-627.500.
Liu, Wai-Min, 4,128,305, Cl. 350-201.000.
Army: *See—*
Black, Walter L., 4,128,059, Cl. 102-92.700.
Cucksee, Marjorie T.; and Allen, Henry C., 4,128,441, Cl. 149-19.920.
Pavlis, James D., 4,128,812, Cl. 328-134.000.
Ramos, Edward; and Cuneo, Joseph V., 4,128,836, Cl. 343-7.0PF.
Rathjen, Edwin H., Jr., 4,128,754, Cl. 219-137.00R.
Reisfeld, Renata; Eckstein, Yona; and Boehm, Leah, 4,128,411, Cl. 65-18.000.
Schulz, Robert J., 4,128,041, Cl. 89-41.00R.
Energy: *See—*
Boquist, Carl W.; and Marchant, David D., 4,128,776, Cl. 310-11.000.
Burleson, Robert R., 4,128,794, Cl. 318-603.000.
Harless, Charles E.; and Taylor, Ward G., 4,127,937, Cl. 30-90.700.
Karr, Clarence, Jr.; and McCaskill, Kenneth B., 4,128,473, Cl. 208-108.000.
Luce, John S., 4,128,764, Cl. 250-398.000.
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Hug, Hans A., 4,128,133, Cl. 173-149.000.
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Reinhardt, Victor S.; and Cervenka, Peter O. External bulb variable volume maser. 4,128,814, Cl. 331-94.000.
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Burns, William K.; and Milton, A. Fenner, 4,128,301, Cl. 350-96.150.
Hunt, Barry R.; Dillard, George M.; and Taylor, Henry F., 4,128,759, Cl. 250-199.000.
Layman, Bobby C.; and Burdge, Lanny G., 4,128,071, Cl. 114-221.00A.
Shaw, Clifford O., 4,128,774, Cl. 307-260.000.
Stotts, Larry B.; Martin, William E.; and Catano, Paul S., 4,128,300, Cl. 350-96.140.
U.S. Philips Corporation: *See—*
Flisikowski, Peter; and Peemoller, Horst, 4,128,781, Cl. 313-60.000.
Fransen, Jan J. B.; and Rimmelzwaan, Franciscus J., 4,128,782, Cl. 313-174.000.
Giller, Henricus F. J. I.; and T'Jampens, Germain R., 4,128,783, Cl. 313-174.000.
Pohlig, Winfried, 4,128,218, Cl. 246-247.000.
Rothgordt, Ulf; Hinz, HansDieter; and Verspui, Gerrit, 4,128,842, Cl. 346-155.000.
Schmedemann, Walter, 4,128,274, Cl. 297-410.000.
Steeghs, Martin H. G., 4,128,790, Cl. 315-382.000.
United States Pipe and Foundry Company: *See—*
Fenster, Abraham S.; and Salloga, Fred W., 4,128,265, Cl. 285-305.000.
United Technologies Corp.: *See—*
Maricle, Donald L., 4,128,701, Cl. 429-21.000.
Sederquist, Richard A., 4,128,700, Cl. 429-17.000.
Universal Technology, Inc.: *See—*
Brady, John F., 4,128,345, Cl. 400-120.000.
University of California, The Regents of the: *See—*
Cram, Donald J., 4,128,556, Cl. 546-26.000.
University of Delaware: *See—*
Heck, Richard F., 4,128,554, Cl. 546-317.000.
University of Sydney, The: *See—*
Harding, Geoffrey L.; McKenzie, David R.; and Window, Brian, 4,128,466, Cl. 204-192.00C.
University of Virginia Alumni Patents Foundation: *See—*
Brooker, Gary L.; Terasaki, Wesley L.; and Price, Michael G., 4,128,628, Cl. 424-1.000.
UOP Inc.: *See—*
Fritsch, Thomas R.; and Anderson, Mark C., 4,128,593, Cl. 260-674.00A.
Homeier, Edwin H., 4,128,621, Cl. 423-362.000.
Pollitzer, Ernest L.; and Hayes, John C., 4,128,590, Cl. 260-666.00A.
Uozumi, Takahiro: *See—*
Ohta, Hideyasu; Uozumi, Takahiro; Kanbe, Masaru; Abe, Naoto; Shirasaki, Jun; and Mayama, Masayoshi, 4,128,426, Cl. 96-87.00R.
Upjohn Company, The: *See—*
Bundy, Gordon L., 4,128,712, Cl. 542-426.000.
Hall, Charles M.; and Wright, John B., 4,128,570, Cl. 260-465.00D.

Hall, Charles M.; and Wright, John B., 4,128,660, Cl. 424-309.000.
Kolakowski, Richard A.; and Stroud, Richard M., 4,128,611, Cl. 264-51.000.
Nelson, Norman A., 4,128,577, Cl. 260-559.00B.
Schneider, William P., 4,128,713, Cl. 542-426.000.
Sebek, Oldrich K.; and Dolak, Lester A., 4,128,563, Cl. 260-343.450.
Szmuszkovicz, Jacob, 4,128,663, Cl. 424-324.000.
Yankee, Ernest W., 4,128,725, Cl. 560-53.000.

Ura, Shigeru; Kondo, Norio; Fukuyama, Yoshiya; and Nakahara, Makoto, to Sumitomo Chemical Company, Limited. Transparentizing agent for paper. 4,128,437, Cl. 106-287.240.

Urasaki, Kazuaki: *See*—
Nagano, Akira; Urasaki, Kazuaki; Osato, Akira; and Sakurai, Isao, 4,128,756, Cl. 235-92.0SB.

Urushidani, Masahiro: *See*—
Takimoto, Masatami; Teramura, Mitsuyoshi; and Urushidani, Masahiro, 4,128,089, Cl. 123-119.00A.

Urwin, Peter T., to Pay Television Corporation. Rotary drive fastener. 4,128,038, Cl. 85-45.000.

Usachev, Vasily P.: *See*—
Sevostiyanov, Vladimir P.; Astakhov, Valery V.; and Usachev, Vasily P., 4,128,314, Cl. 350-341.000.

USM Corporation: *See*—
Hollick, John G., 4,127,910, Cl. 12-146.00D.
Rawson, Francis F. H., 4,128,609, Cl. 264-23.000.

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Terekhov, Kuzma I.; Tumanov, Alexei T.; Ozerova, Alexandra P.; Topilin, Valentin V.; Dzugutov, Mikhail Y.; Ljubinskaya, Mara A.; Pashchnik, Gennady A.; Nikishov, Alexandr S.; and Ustinov, Terenty I., 4,128,419, Cl. 75-171.000.

Uthoff, Werner; and Kluepfel, Olaf, to Haver & Boecker Drahtweberei und Maschinenfabrik. Method and apparatus for opening and stacking bags. 4,128,116, Cl. 141-1.000.

Valek, Robert J.; and Gartner, Todd H., to Motorola, Inc. Digital circuitry for spark timing and exhaust gas recirculation control. 4,128,885, Cl. 364-424.000.

Valmet Oy: *See*—
Kankaanpaa, Matti, 4,128,053, Cl. 100-162.00R.

van den Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., to Monroe Auto Equipment Company. Windshield wiper construction. 4,127,916, Cl. 15-250.420.

van der Drift, Johannes K.; Henniger, Peter W.; and van Veen, Gerard J., to Gist-Brocades N.V. 6-(D-α-Amino-p-hydroxyphenylacetamido)-penicillanic acid preparation. 4,128,547, Cl. 260-239.100.

van der Lely, Cornelis. Soil cultivating implements. 4,128,129, Cl. 172-59.000.

van Eekelen, Alex H.: *See*—
van den Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 4,127,916, Cl. 15-250.420.

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Akkerman, Antony M.; and van Leeuwen, Geertruida C., 4,128,548, Cl. 542-429.000.

van Linden, Jan H. L.; Claxton, Raymond J.; Herrick, Joseph R.; and Ormesher, Robert J., to Aluminum Company of America. Aluminum scrap reclamation. 4,128,415, Cl. 75-65.00R.

Van Poucke, Raphael K.: *See*—
Monbaliu, Marcel J.; and Van Poucke, Raphael K., 4,128,427, Cl. 96-100.00R.

van Veen, Gerard J.: *See*—
van der Drift, Johannes K.; Henniger, Peter W.; and van Veen, Gerard J., 4,128,547, Cl. 260-239.100.

Varney, Bernard: *See*—
Caron, Jacques; Poncet, Jean-Claude; and Varney, Bernard, 4,128,004, Cl. 73-38.000.

Varta Batterie Aktiengesellschaft: *See*—
Winsel, August, 4,128,705, Cl. 429-171.000.

Vasa, Suresh L., to Fairchild Camera and Instrument Corporation. Pulse width measurement circuitry. 4,128,892, Cl. 364-900.000.

Vaslas, John W. Auxiliary handle for long-handled implements. 4,128,266, Cl. 294-58.000.

Vassar, Clyde W.: *See*—
Kemerer, William J.; and Vassar, Clyde W., 4,128,369, Cl. 425-113.000.

Vassar, Hervey P. Brake and wheel lock. 4,128,144, Cl. 188-1.00D.

VDO Adolf Schindling AG: *See*—
Rietmuller, Karl-Heinz, 4,128,859, Cl. 362-26.000.

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Euverard, Maynard R., 4,128,165, Cl. 198-844.000.

Vereinigte Osterreichische Eisen- und Stahlwerke — Alpine Montan Aktiengesellschaft: *See*—
Eysn, Manfred; and Moser, Hans, 4,128,233, Cl. 266-243.000.

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Vickers Limited: *See*—
Thomas, John C., 4,127,930, Cl. 29-527.600.

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Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., 4,128,729, Cl. 568-820.000.

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Visidyne, Inc.: *See*—
Zehnpfennig, Theodore F., 4,128,337, Cl. 356-346.000.

Vital, Zoltan; and Orban, Jean, to Vivitar Corporation. Control of electronically generated light pulses. 4,128,786, Cl. 315-151.000.

Vitek, John M., to Olin Corporation. Enhanced grain growth in arsenic modified copper-zinc brasses. 4,128,418, Cl. 75-157.500.

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Vital, Zoltan; and Orban, Jean, 4,128,786, Cl. 315-151.000.

Vlach, Anthony R. Golfer's training aid. 4,128,245, Cl. 273-183.00A.

Voegelin, Heinrich, to Fritz Buser AG Maschinenfabrik. Positive engagement clutch with soft engagement motion. 4,128,154, Cl. 192-67.00P.

Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Pyrazolo(1,5-c)quinazoline derivatives and related compounds. 4,128,644, Cl. 424-251.000.

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Hoehn, Hans; Bernstein, Jack; and Vogt, B. Richard, 4,128,717, Cl. 544-361.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Leppich, Erhard, 4,128,149, Cl. 188-322.000.

Vollkommer, Norbert; Petersen, Egon N.; Klinkenberg, Herbert; and Schmidt, Werner, to Dynamit Nobel Aktiengesellschaft. Acrylate-based polymers and their use as flameproofing agents. 4,128,709, Cl. 526-218.000.

Voloschenko, Nikolai I.: *See*—
Shakula, Nikolai M.; Voloschenko, Nikolai I.; Shishkin, Nikolai F.; Muratov, Anatoly S.; Guzchenko, Alexandr P.; Anokhin, Vladimir M.; and Nikitchenko, Vladimir F., 4,128,367, Cl. 425-11.000.

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Barth, Gunter; and Von Langsdorff, Fritz, 4,128,357, Cl. 404-41.000.

Vosbeek, Gerardus J., to Oce-Nederland B.V. Diazotype material that can be developed by applying a small amount of developing liquid, and development thereof. 4,128,423, Cl. 96-49.000.

Voss, Hans W.: *See*—
Kluting, Bernd; and Voss, Hans W., 4,128,225, Cl. 248-421.000.

W. R. Grace & Co.: *See*—
Lowther, Frank E., 4,128,788, Cl. 315-176.000.
Wszolek, Walter R., 4,128,185, Cl. 215-349.000.

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Geschonke, Hans; Rompeltien, Rainer; and Rummel, Wolfgang, 4,128,516, Cl. 260-29.60R.

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Yeakey, Ernest L.; and Waddill, Harold G., 4,128,525, Cl. 260-29.10R.

Wade, Glenn C. Inhabitable enclosure and methods relating thereto. 4,128,204, Cl. 237-1.00A.

Wadsworth, Donald H.: *See*—
Fletcher, George L.; Wadsworth, Donald H.; and Jones, Jean E., 4,128,422, Cl. 96-48.0HD.

Wahl, Erwin R.: *See*—
Hartitz, Joachim E.; Nehemy, Sam D.; and Wahl, Erwin R., 4,128,379, Cl. 425-446.000.

Wahlco Inc.: *See*—
Murad, Sammy Y., 4,128,871, Cl. 363-144.000.

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Bourquin, Jean-Pierre; Schwarb, Gustav; and Waldvogel, Erwin, 4,128,549, Cl. 546-202.000.

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Walker, Loren H.: *See*—
Ferro, Armand P.; and Walker, Loren H., 4,128,785, Cl. 315-57.000.

Walter Kidde & Company, Inc.: *See*—
Greenwald, Harry; and Larkin, Dennis J., 4,128,156, Cl. 194-61.000.

Walter, Lothar: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; and Schulz, Toni, 4,128,279, Cl. 308-6.00C.

Walz, Klaus: *See*—
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Pond, David M.; and Wang, Richard H., 4,128,559, Cl. 260-308.00B.

Wang, Samuel S.; and Smith, Eugene L., Jr., to American Cyanamid Company. Process for beneficiation of mineral values. 4,128,475, Cl. 209-166.000.

Ward, Donald H.: *See*—
Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., 4,128,888, Cl. 364-565.000.

Warner-Lambert Company: *See*—
Butler, Donald E., 4,128,555, Cl. 546-290.000.
Wise, Lawrence D.; Flynn, Patrick F.; and Morrison, Glenn C., 4,128,552, Cl. 546-294.000.

Warzawa, Wolfgang: *See*—
Huschka, Hans; and Warzawa, Wolfgang, 4,128,075, Cl. 118-49.100.

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Ojima, Shin; Ohgami, Kazuhiko; Watanabe, Kazutaka; Nohara, Masaru; and Yamamoto, Kenji, 4,128,889, Cl. 364-705.000.

Watanabe, Kenzi; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd.

Method for super calendering magnetic recording elements. 4,128,673, Cl. 427-130.000.

Watts, Robert H.: *See—*
Bradbury, William B.; Watts, Robert H.; and Scott, E. Timm, 4,128,211, Cl. 241-101.600.

Wean United, Inc.: *See—*
Meurer, Hans; and Rehag, Klaus, 4,127,998, Cl. 72-97.000.

Webb, Bryant F.: *See—*
Parrish, Charles A.; and Webb, Bryant F., 4,127,981, Cl. 56-14.400.

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Weber, Robert: *See—*
Fairley, John; Krickl, Josef; and Weber, Robert, 4,128,755, Cl. 235-92.00T.

Webermeier, Kurt: *See—*
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Wegemund, Bernd: *See—*
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Lowrey, Robert D.; Wegwerth, Arthur A.; Koeck, Donna M.; and Cobb, Sanford, Jr., 4,128,685, Cl. 428-212.000.

Wehry, Charles F., Jr.: *See—*
Oren, Jess W., III; Kirchner, Eugene M.; and Wehry, Charles F., Jr., 4,128,095, Cl. 126-270.000.

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B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 405,899	4,097,710	Mar. 23, 1976	Mar. 21, 1978
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,837	4,128,582	Mar. 2, 1976	Dec. 5, 1978
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 449,989	4,061,572	Mar. 30, 1976	Dec. 6, 1977
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,257	4,078,715	Jan. 13, 1976	Mar. 14, 1978
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977
B 471,706	4,076,275	Mar. 16, 1976	Feb. 28, 1978
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 475,801	4,056,759	Mar. 30, 1976	Nov. 1, 1977
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,439	4,057,521	Apr. 13, 1976	Nov. 8, 1977
B 494,440	4,056,502	Feb. 17, 1976	Nov. 1, 1977
B 494,450	4,079,029	Feb. 17, 1976	Mar. 14, 1978
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,124	4,060,968	Mar. 9, 1976	Dec. 6, 1977
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,490	4,118,377	Mar. 23, 1976	Oct. 3, 1978
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,128	4,072,723	Feb. 24, 1976	Feb. 7, 1978
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,773	4,125,406	Jan. 13, 1976	Nov. 14, 1978
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977	B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 515,216	4,076,261	Feb. 17, 1976	Feb. 28, 1978
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 507,456	4,080,349	Mar. 9, 1976	Mar. 21, 1978	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977	B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976	B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976	B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976	B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976	B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976	B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976	B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976	B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976	B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976	B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976	B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976	B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976	B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976	B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977	B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976	B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976	B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976	B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976	B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976	B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976	B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977	B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976	B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976	B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976	B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976	B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976	B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977	B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976	B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 513,346	4,124,330	Mar. 9, 1976	Nov. 7, 1978	B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976	B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976	B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976	B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977	B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976	B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977	B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977	B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 537,990	4,057,651	Jan. 13, 1976	Nov. 8, 1977
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977	B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976	B 632,416	4,076,698	Mar. 9, 1976	Feb. 28, 1978
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 5TH DAY OF DECEMBER, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Arthur, Leonard T.: *See—*
Dulat, Joseph; and Arthur, Leonard T., T977,004, Cl. 260-23.00S.

Balasubramanian, Peruvemba S.; Grazier, Edwin C.; Henke, John D.; Latham, Robert P.; and Myers, Martin J., to International Business Machines Corporation. Read only memory with optimized dimension for improved performance and chip area utilization. T977,006, 12-5-78, Cl. 357-45.000.

Bexford Limited Imperial Chemical House: *See—*
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T977,001, Cl. 96-75.000.
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T977,002, Cl. 96-75.000.

Desmarais, Armand J., to Hercules Incorporated. Joint cement compositions containing mica and quaternary compounds. T977,003, 12-5-78, Cl. 260-17.00R.

Di Sanzo, Carmine P.; and Engel, John F., to FMC Corporation. Control of nematodes with selected N-aminosulfenyl, N-arylsulfenyl and N-acylamidosulfenyl derivatives of 2,3-dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate. T977,008, 12-5-78, Cl. 424-285.000.

Dulat, Joseph; and Arthur, Leonard T., to United States Borax & Chemical Corporation. Fire retardant polymer compositions. T977,004, 12-5-78, Cl. 260-23.00S.

Dumas, David H.; and Warren, David R., to Hercules Incorporated. Gypsum wallboard and method for producing same. T977,009, 12-5-78, Cl. 428-476.000.

Engel, John F.: *See—*
Di Sanzo, Carmine P.; and Engel, John F., T977,008, Cl. 424-285.000.

FMC Corporation: *See—*
Di Sanzo, Carmine P.; and Engel, John F., T977,008, Cl. 424-285.000.

Grazier, Edwin C.: *See—*
Balasubramanian, Peruvemba S.; Grazier, Edwin C.; Henke, John D.; Latham, Robert P.; and Myers, Martin J., T977,006, Cl. 357-45.000.

Henke, John D.: *See—*
Balasubramanian, Peruvemba S.; Grazier, Edwin C.; Henke, John D.; Latham, Robert P.; and Myers, Martin J., T977,006, Cl. 357-45.000.

Hercules Incorporated: *See—*
Desmarais, Armand J., T977,003, Cl. 260-17.00R.
Dumas, David H.; and Warren, David R., T977,009, Cl. 428-476.000.

Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., to Bexford Limited Imperial Chemical House. Light-sensitive vesicular recording materials. T977,001, 12-5-78, Cl. 96-75.000.

Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., to Bexford Limited Imperial Chemical House. Vesicular recording materials having an adhesive layer. T977,002, 12-5-78, Cl. 96-75.000.

International Business Machines Corporation: *See—*
Balasubramanian, Peruvemba S.; Grazier, Edwin C.; Henke, John D.; Latham, Robert P.; and Myers, Martin J., T977,006, Cl. 357-45.000.

Kearney & Trecker Corporation: *See—*
Selander, Douglas S., T977,007, Cl. 364-474.000.

Latham, Robert P.: *See—*
Balasubramanian, Peruvemba S.; Grazier, Edwin C.; Henke, John D.; Latham, Robert P.; and Myers, Martin J., T977,006, Cl. 357-45.000.

Lothian, David E.: *See—*
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T977,001, Cl. 96-75.000.
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T977,002, Cl. 96-75.000.

Myers, Martin J.: *See—*
Balasubramanian, Peruvemba S.; Grazier, Edwin C.; Henke, John D.; Latham, Robert P.; and Myers, Martin J., T977,006, Cl. 357-45.000.

Rennison, Stuart C.: *See—*
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T977,001, Cl. 96-75.000.
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T977,002, Cl. 96-75.000.

Selander, Douglas S., to Kearney & Trecker Corporation. Program modification registers for numerically controlled machine tools. T977,007, 12-5-78, Cl. 364-474.000.

Sidles, Peter, Jr.; and Wulff, Bernard J. Step assembly flexibly mounted. T977,005, 12-5-78, Cl. 280-163.000.

Titman, Michael K.: *See—*
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T977,001, Cl. 96-75.000.
Huffey, Roy F.; Lothian, David E.; Rennison, Stuart C.; and Titman, Michael K., T977,002, Cl. 96-75.000.

United States Borax & Chemical Corporation: *See—*
Dulat, Joseph; and Arthur, Leonard T., T977,004, Cl. 260-23.00S.

Warren, David R.: *See—*
Dumas, David H.; and Warren, David R., T977,009, Cl. 428-476.000.

Wulff, Bernard J.: *See—*
Sidles, Peter, Jr.; and Wulff, Bernard J., T977,005, Cl. 280-163.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF DECEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Argauer, Robert J.; and Landolt, George R., to Mobil Oil Corporation. Conversion with ZSM-family of crystalline aluminosilicate zeolites. Re. 29,857, Cl. 208-111.000.

Burroughs Corporation: *See—*
Miller, Donald E., Re. 29,858, Cl. 313-217.000.

Canon Kabushiki Kaisha: *See—*
Kano, Ichiro, Re. 29,856, Cl. 350-183.000.

Clark Equipment Company: *See—*
Shealy, Noah A., Re. 29,854, Cl. 74-711.000.

Honda, Jack S.: *See—*
Yuan, Lloyd T.; and Honda, Jack S., Re. 29,859, Cl. 325-445.000.

Kano, Ichiro, to Canon Kabushiki Kaisha. Projection lens for mask pattern printing. Re. 29,856, Cl. 350-183.000.

Landolt, George R.: *See—*
Argauer, Robert J.; and Landolt, George R., Re. 29,857, Cl. 208-111.000.

Miller, Donald E., to Burroughs Corporation. Display panel. Re. 29,858, Cl. 313-217.000.

Mobil Oil Corporation: *See—*
Argauer, Robert J.; and Landolt, George R., Re. 29,857, Cl. 208-111.000.

Shealy, Noah A., to Clark Equipment Company. Limited slip differential with negligible bias under light load conditions. Re. 29,854, Cl. 74-711.000.

Thomas, Edward L. Fastener positioning device. Re. 29,855, Cl. 221-263.000.

TRW Inc.: *See—*
Yuan, Lloyd T.; and Honda, Jack S., Re. 29,859, Cl. 325-445.000.

Yuan, Lloyd T.; and Honda, Jack S., to TRW Inc. Broadband waveguide mixer. Re. 29,859, Cl. 325-445.000.

LIST OF PLANT PATENTEES

Duffett, William E.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,341, Cl. 78.000.
Dugan Nurseries Incorporated: *See*—
Nielsen, Peter R., 4,340, Cl. 63.000.
Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,341, 12-5-78, Cl. 78.000.
Nielsen, Peter R., to Dugan Nurseries Incorporated. Euonymus plant. 4,340, 12-5-78, Cl. 63.000.
Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,341, Cl. 78.000.
Zaiger, C. Floyd. Plumcot tree. 4,338, 12-5-78, Cl. 38.000.
Zaiger, C. Floyd. Apricot tree. 4,339, 12-5-78, Cl. 39.000.

LIST OF DESIGN PATENTEES

Babcock, Giles R., to Pelton & Crane Company. Foot controller for dental handpiece instruments. 250,479, 12-5-78, Cl. D24-5.000.
Baikie, Hugh E.; and Schaack, Peter W., to Kenbudge Holdings Limited. Ice skate. 250,490, 12-5-78, Cl. D34-14.00B.
Barkee, Charles J.: *See*—
Olson, DeForrest A., decesed, 250,476, Cl. D16-54.000.
Bauer, Russell E. Armored car. 250,458, 12-5-78, Cl. D12-12.000.
Boldt, Melvin H.; Morrison, Thurber H.; and Huff, Robert S., to National Presto Industries, Inc. Electric cooking utensil. 250,448, 12-5-78, Cl. D7-94.000.
Bott, John A. Automotive luggage rack stanchion. 250,461, 12-5-78, Cl. D12-157.000.
Bott, John A. Design for vehicle luggage rack stanchion. 250,464, 12-5-78, Cl. D12-157.000.
Bourgeois, Ronald D. Roller conveyor belt for curved path. 250,460, 12-5-78, Cl. D12-60.000.
Bourgeois, Ronald D. Roller conveyor belt for curved path. 250,462, 12-5-78, Cl. D12-60.000.
Braun, Werner, to Maxs AG. Combined coffee filter and support base. 250,445, 12-5-78, Cl. D7-47.000.
Brinkmann, John B. Hand-held spotlight. 250,493, 12-5-78, Cl. D48-20.00K.
Canon Kabushiki: *See*—
Kando, Masahiro, 250,475, Cl. D16-42.000.
CBS Inc.: *See*—
Korpijaakko, Erkki P.; and Moustakas, Matthew A., 250,437, Cl. D6-5.000.
Chartier, Donald A.; and Janes, Richard. Vise grip clamp for stringing racquets. 250,451, 12-5-78, Cl. D8-52.000.
Compagnie Generale des Etablissements Michelin: *See*—
Jamain, Philippe, 250,463, Cl. D12-149.000.
Cuthbertson, Eugene R. Smoking device. 250,485, 12-5-78, Cl. D27-03.000.
Dallaire, Raymond, to P. H. Tech Inc. Window component extrusion. 250,483, 12-5-78, Cl. D25-74.000.
Danat, Alfred W.; and Schaefer, John L., to Sallet, Inc. Drinking mug. 250,444, 12-5-78, Cl. D7-5.000.
DeMyer, Donald L. Hinge for poultry cage gate. 250,487, 12-5-78, Cl. D30-2.000.
E-Z Fill Corporation: *See*—
O'Banion, John D., 250,466, Cl. D12-197.000.
O'Banion, John D., 250,467, Cl. D12-197.000.
O'Banion, John D., 250,468, Cl. D12-197.000.
Eye-Vue Systems, Inc.: *See*—
Loiacono, Joseph, 250,438, Cl. D6-28.000.
Feck, Carl J. Pool table top with non-uniform rails. 250,489, 12-5-78, Cl. D34-3.000.
Fields, Chester. Containerized pallet. 250,459, 12-5-78, Cl. D12-53.000.
Fishman, Martin B. Earring. 250,456, 12-5-78, Cl. D11-48.000.
Fishman, Martin B. Earring. 250,457, 12-5-78, Cl. D11-55.000.
Forstrom, Robert H. Building. 250,482, 12-5-78, Cl. D25-23.000.
Foxmohr Crafts, Inc.: *See*—
Mohrhauser, James E., 250,455, Cl. D10-116.000.
Fram Corporation: *See*—
Heischman, Frederick E., 250,452, Cl. D8-91.000.
Frohling, Lucien O., to General Foods Corporation. Bottle. 250,454, 12-5-78, Cl. D9-67.000.
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Hale, Allan N.; and Hale, Helen W. Page holder for an open book. 250,477, 12-5-78, Cl. D19-34.000.
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Heischman, Frederick E., to Fram Corporation. Honing tool. 250,452, 12-5-78, Cl. D8-91.000.
Holstein, Thomas. Bath tub tray. 250,439, 12-5-78, Cl. D6-86.000.
Horwitz, Howard J., to Horwitz, Spencer G., a part interest. Swivel hook. 250,453, 12-5-78, Cl. D8-367.000.
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Ikoma, Tethuro, to Sansui Electric Co., Ltd. Tape deck. 250,472, 12-5-78, Cl. D14-6.000.
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Pesiri, James B., 250,442, Cl. D6-191.000.
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Jamain, Philippe, to Compagnie Generale des Etablissements Michelin. Tire. 250,463, 12-5-78, Cl. D12-149.000.
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Johnson, Elias J. Paint applicator. 250,436, 12-5-78, Cl. D4-38.000.
Johnson, Rodney A.; and Selby, Francis W. Condiment dispenser. 250,446, 12-5-78, Cl. D7-57.000.
Kadota, Toshihiko, to Olympus Optical Company Ltd. Tape recorder. 250,473, 12-5-78, Cl. D14-6.000.
Kando, Masahiro, to Canon Kabushiki. Adjustable head electronic flash unit. 250,475, 12-5-78, Cl. D16-42.000.
Kelly, William T., III; and Stahl, Francis, to Union Carbide Corporation. Multi-cell battery charger. 250,469, 12-5-78, Cl. D13-5.000.
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Korpijaakko, Erkki P.; and Moustakas, Matthew A., to CBS Inc. Child's desk. 250,437, 12-5-78, Cl. D6-5.000.
Levin, Monte L., to Scovill Manufacturing Company. Electric donut maker. 250,447, 12-5-78, Cl. D7-88.000.
Levin, Monte L., to Scovill Manufacturing Company. Electric deep fat fryer. 250,449, 12-5-78, Cl. D7-94.000.
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McCorkle, Boyce R. Smoking pipe. 250,486, 12-5-78, Cl. D27-03.000.
Millspaugh, S. Kirk, to Kirk Corporation, The. Flatware cabinet. 250,440, 12-5-78, Cl. D6-172.000.
Mohrhauser, James E., to Foxmohr Crafts, Inc. Wind chimes. 250,455, 12-5-78, Cl. D10-116.000.
Mollura, Carlos A. Cassette case. 250,495, 12-5-78, Cl. D87-1.00D.
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Nishigaki, Koichi, to Victor Company of Japan, Limited. Video disc player. 250,470, 12-5-78, Cl. D14-2.000.
Nishigaki, Koichi, to Victor Company of Japan, Limited. Video tape recorder. 250,471, 12-5-78, Cl. D14-2.000.
Nishigaki, Koichi, to Victor Company of Japan, Limited. Video tape cassette. 250,474, 12-5-78, Cl. D14-11.000.
O'Banion, John D., to E-Z Fill Corporation. Tank cap. 250,466, 12-5-78, Cl. D12-197.000.
O'Banion, John D., to E-Z Fill Corporation. Tank cap. 250,467, 12-5-78, Cl. D12-197.000.
O'Banion, John D., to E-Z Fill Corporation. Tank cap. 250,468, 12-5-78, Cl. D12-197.000.
Ogawa, Iwakichi, to Takara Co., Ltd. Drawing toy. 250,491, 12-5-78, Cl. D34-15.00R.
Olson, DeForrest A., decesed, to Barkee, Charles J. Hand-held viewer for navigational charts or the like. 250,476, 12-5-78, Cl. D16-54.000.

Olympus Optical Company Ltd.: *See—*
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Tiedemann, Robert J., to Toro Company, The. Cordless vegetation trimmer. 250,450, 12-5-78, Cl. D8-8.000.
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Nishigaki, Koichi, 250,471, Cl. D14-2.000.
Nishigaki, Koichi, 250,474, Cl. D14-11.000.
Wettermann, Ludwig A.; and Wettermann, Peter H., to Richard Wolf Medical Instruments Corporation. Bipolar electrical surgical generator. 250,480, 12-5-78, Cl. D24-8.000.
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Wettermann, Ludwig A.; and Wettermann, Peter H., 250,480, Cl. D24-8.000.
Whattam, Goerge F., to Hynson, Westcott & Dunning, Inc. Blood collector. 250,481, 12-5-78, Cl. D24-21.000.
Wilmot, Paul C. Animal tether. 250,488, 12-5-78, Cl. D30-44.000.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 5, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

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218	4,128,709

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4,128,712
4,128,713
4,128,725
4,128,737
4,128,738
4,128,818
4,128,841
27 : 4,127,942
4,127,951
4,128,010
4,128,013

4,128,074	4,128,343	4,128,351	4,128,212	4,127,953	47 : 4,128,204
4,128,175	4,128,345	4,128,352	4,128,789	4,128,252	4,128,265
4,128,290	4,128,360	4,128,356	4,128,807	4,128,269	4,128,393
4,128,325	4,128,398	4,128,401	38 : 4,128,107	42 : 4,127,924	4,128,559
4,128,493	4,128,444	4,128,406	39 : 4,127,940	4,127,961	4,128,622
4,128,513	4,128,445	4,128,422	4,127,994	4,127,976	4,128,794
4,128,576	4,128,459	4,128,430	4,128,016	4,127,981	48 : 4,127,902
4,128,600	4,128,465	4,128,431	4,128,062	4,128,024	4,127,903
4,128,631	4,128,485	4,128,439	4,128,117	4,128,058	4,127,935
4,128,659	4,128,490	4,128,440	4,128,160	4,128,095	4,127,950
4,128,664	4,128,504	4,128,451	4,128,166	4,128,100	4,127,990
4,128,680	4,128,505	4,128,477	4,128,178	4,128,155	4,128,047
4,128,685	4,128,515	4,128,496	4,128,184	4,128,190	4,128,104
4,128,854	4,128,520	4,128,497	4,128,189	4,128,232	4,128,106
4,128,874	4,128,536	4,128,507	4,128,208	4,128,344	4,128,127
4,128,875	4,128,586	4,128,535	4,128,223	4,128,369	4,128,135
4,128,880	4,128,591	4,128,538	4,128,235	4,128,389	4,128,192
4,128,887	4,128,592	4,128,550	4,128,258	4,128,391	4,128,207
4,128,898	4,128,599	4,128,557	4,128,259	4,128,392	4,128,220
28 : 4,128,219	4,128,616	4,128,574	4,128,318	4,128,415	4,128,229
29 : 4,127,919	4,128,632	4,128,583	4,128,379	4,128,448	4,128,298
4,127,968	4,128,633	4,128,602	4,128,383	4,128,471	4,128,358
4,128,404	4,128,640	4,128,603	4,128,385	4,128,487	4,128,407
4,128,509	4,128,647	4,128,604	4,128,399	4,128,501	4,128,456
31 : 4,128,205	4,128,648	4,128,619	4,128,429	4,128,512	4,128,472
4,128,245	4,128,649	4,128,641	4,128,450	4,128,517	4,128,514
4,128,359	4,128,653	4,128,670	4,128,458	4,128,519	4,128,525
32 : 4,127,947	4,128,662	4,128,674	4,128,463	4,128,524	4,128,746
33 : 4,128,163	4,128,688	4,128,697	4,128,479	4,128,541	4,128,761
4,128,238	4,128,721	4,128,699	4,128,484	4,128,564	4,128,846
4,128,341	4,128,729	4,128,703	4,128,488	4,128,587	4,128,888
4,128,454	4,128,772	4,128,711	4,128,523	4,128,588	49 : 4,128,173
34 : Re.29,858	4,128,784	4,128,726	4,128,530	4,128,644	50 : 4,127,973
4,127,907	35 : 4,128,271	4,128,731	4,128,581	4,128,666	51 : 4,128,039
4,127,932	4,128,273	4,128,748	4,128,597	4,128,722	4,128,071
4,127,944	36 : 4,127,911	4,128,760	4,128,601	4,128,734	4,128,165
4,128,003	4,127,912	4,128,785	4,128,613	4,128,745	4,128,301
4,128,007	4,127,967	4,128,787	4,128,710	4,128,777	4,128,628
4,128,033	4,127,980	4,128,788	4,128,766	4,128,779	4,128,811
4,128,037	4,128,101	4,128,829	4,128,858	4,128,824	53 : 4,127,933
4,128,051	4,128,105	4,128,833	4,128,864	4,128,860	4,128,000
4,128,109	4,128,119	4,128,850	4,128,901	4,128,865	4,128,040
4,128,134	4,128,121	4,128,861	40 : 4,128,025	4,128,886	4,128,198
4,128,141	4,128,156	4,128,863	4,128,078	43 : 4,127,962	4,128,443
4,128,144	4,128,162	4,128,890	4,128,179	4,127,971	54 : 4,128,473
4,128,150	4,128,180	4,128,891	4,128,405	44 : 4,128,128	55 : 4,127,934
4,128,211	4,128,243	4,128,895	4,128,410	4,128,278	4,127,949
4,128,239	4,128,266	4,128,897	4,128,595	45 : Re.29,855	4,128,006
4,128,242	4,128,285	37 : 4,127,926	4,128,596	4,128,282	4,128,455
4,128,291	4,128,299	4,128,094	4,128,735	46 : 4,128,193	4,128,637
4,128,315	4,128,304	4,128,170	4,128,946	4,128,808	4,128,793
4,128,316	4,128,313	4,128,209	41 : 4,127,946		

DESIGN PATENTS

6 : 250,465	250,469	24 : 250,440	250,461	36 : 250,438	48 : 250,466
01 : 250,444	12 : 250,446	250,477	250,464	250,441	250,467
06 : 250,442	13 : 250,484	250,481	250,487	250,443	250,468
250,453	17 : 250,439	25 : 250,456	33 : 250,451	250,447	250,493
250,485	250,448	250,457	34 : 250,437	250,449	53 : 250,459
250,494	250,480	250,460	250,454	37 : 250,479	250,476
250,495	18 : 250,488	250,462	250,482	39 : 250,452	55 : 250,436
09 : 250,450	250,489	26 : 250,458	250,492	47 : 250,486	250,455

PLANT PATENTS

06 : 4,338	4,339	54 : 4,341			

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

10 : T977,003	T977,009	17 : T977,005	36 : T977,008	51 : T977,006	55 : T977,007

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